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SEQUENCE LISTING

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<120> USE OF PROTEINS AND PEPTIDES CODED BY THE GENOME OF A NOVEL STRAIN OF SARS-ASSOCIATED CORONAVIRUS

<130> 226-111ext

<150> FR 0314152
<151> 2003-12-02

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<151> 2003-12-02

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<170> PatentIn version 3.1

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<212> DNA

<213> CORONAVIRUS

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gttattctga	ggataggcac	tcaggtgtt	aaagactatgt	cgttgcacat	ggcttattca	780
ccgaagttta	ctaccagctt	gagtctacac	aaatttactac	agacactgg	attgaaaatg	840
ctacattctt	catctttaac	aagcttgc	aaagacccacc	gaatgtgca	atcacacaa	900
tcgacggctc	ttcaggagtt	gctaattccag	caatggatcc	aattttatgt	gagccgacga	960
cgactactag	cgtgcctttg	taagcacaa	aaagtgcgt	cgaactttag	tactcattcg	1020
tttcggaaaga	aacaggtacg	ttaatagtt	atagcgtact	tcttttctt	gctttcgtgg	1080
tattcttgc	agtcacacata	gccatccta	ctgcgttgc	attgtgtcg	tactg	1135

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<211> 1096
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS
<222> (137)..(958)
<223>

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 cttgctgcaaa gtttgcgatgag gatgactctg agccagtttca aagggtgtc aaattacatt
 acacataaaac gaactt atg gat ttg ttt atg aga ttt ttt act ctt gga tca
 Met Asp Leu Phe Met Arg Phe Phe Thr Leu Gly Ser
 1 5 10
 att act gca cag cca gta aaa att gac aat gct tct cct gca agt act
 Ile Thr Ala Gln Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr
 15 20 25
 220
 gtt cat gct aca gca acg ata ccg cta caa gcc tca ctc cct ttc gga
 Val His Ala Thr Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly
 30 35 40
 268
 tgg ctt gtt att ggc gtt gca ttt ctt gct gtt ttt cag agc gct acc
 Trp Leu Val Ile Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr
 45 50 55 60
 316
 aaa ata att gcg ctc aat aaa aga tgg cag cta gcc ctt tat aag ggc
 Lys Ile Ile Ala Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly
 65 70 75
 364
 ttc cag ttc att tgc aat tta ctg ctg cta ttt gtt acc atc tat tca
 Phe Gln Phe Ile Cys Asn Leu Leu Leu Phe Val Thr Ile Tyr Ser
 80 85 90
 412
 cat ctt ttg ctt gtc gct gca ggt atg gag gcg caa ttt ttg tac ctc
 His Leu Leu Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu
 95 100 105
 460
 tat gcc ttg ata tat ttt cta caa tgc atc aac gca tgt aga att att
 Tyr Ala Leu Ile Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile
 110 115 120
 508
 atg aga tgt tgg ctt tgt tgg aag tgc aaa tcc aag aac cca tta ctt
 Met Arg Cys Trp Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu
 125 130 135 140
 556
 tat gat gcc aac tac ttt gtt tgc tgg cac aca cat aac tat gac tac
 Tyr Asp Ala Asn Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr
 145 150 155
 604
 tgt ata cca tat aac agt gtc aca gat aca att gtc gtt act gaa ggt
 Cys Ile Pro Tyr Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly
 160 165 170
 652
 gac ggc att tca aca cca aaa ctc aaa gaa gac tac caa att ggt ggt
 Asp Gly Ile Ser Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly
 175 180 185
 700
 tat tct gag gat agg cac tca ggt gtt aaa gac tat gtc gtt gta cat
 Tyr Ser Glu Asp Arg His Ser Gly Val Lys Asp Tyr Val Val Val His
 190 195 200
 748
 ggc tat ttc acc gaa gtt tac tac cag ctt gag tct aca caa att act
 Gly Tyr Phe Thr Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr
 205 210 215 220
 796
 aca gac act ggt att gaa aat gct aca ttc ttc atc ttt aac aag ctt
 Thr Asp Thr Gly Ile Glu Asn Ala Thr Phe Phe Ile Phe Asn Lys Leu
 225 230 235
 844
 gtt aaa gac cca ccg aat gtg caa ata cac aca atc gac ggc tct tca
 Val Lys Asp Pro Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser
 240 245 250
 892

gga gtt gct aat cca gca atg gat cca att tat gat gag ccg acg acg	940
Gly Val Ala Asn Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr	
255 260 265	
act act agc gtg cct ttg taagcacaag aaagttagta cgaacttatg	988
Thr Thr Ser Val Pro Leu	
270	
tactcattcg ttccgaga aacaggtacg ttaatagtt atagcgact tcctttctt	1048
gcttcgtgg tattcttgct agtcacacta gccatcctta ctgcgcctt	1096

<210> 10
 <211> 274
 <212> PRT
 <213> CORONAVIRUS

<400> 10
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 1 5 10 15
 Pro Val Lys Ile Asp Asn Ala Ser Pro Ala Ser Thr Val His Ala Thr
 20 25 30
 Ala Thr Ile Pro Leu Gln Ala Ser Leu Pro Phe Gly Trp Leu Val Ile
 35 40 45
 Gly Val Ala Phe Leu Ala Val Phe Gln Ser Ala Thr Lys Ile Ile Ala
 50 55 60
 Leu Asn Lys Arg Trp Gln Leu Ala Leu Tyr Lys Gly Phe Gln Phe Ile
 65 70 75 80
 Cys Asn Leu Leu Leu Phe Val Thr Ile Tyr Ser His Leu Leu Leu
 85 90 95
 Val Ala Ala Gly Met Glu Ala Gln Phe Leu Tyr Leu Tyr Ala Leu Ile
 100 105 110
 Tyr Phe Leu Gln Cys Ile Asn Ala Cys Arg Ile Ile Met Arg Cys Trp
 115 120 125
 Leu Cys Trp Lys Cys Lys Ser Lys Asn Pro Leu Leu Tyr Asp Ala Asn
 130 135 140
 Tyr Phe Val Cys Trp His Thr His Asn Tyr Asp Tyr Cys Ile Pro Tyr
 145 150 155 160
 Asn Ser Val Thr Asp Thr Ile Val Val Thr Glu Gly Asp Gly Ile Ser
 165 170 175
 Thr Pro Lys Leu Lys Glu Asp Tyr Gln Ile Gly Gly Tyr Ser Glu Asp
 180 185 190
 Arg His Ser Gly Val Lys Asp Tyr Val Val His Gly Tyr Phe Thr
 195 200 205
 Glu Val Tyr Tyr Gln Leu Glu Ser Thr Gln Ile Thr Thr Asp Thr Gly
 210 215 220
 Ile Glu Asn Ala Thr Phe Ile Phe Asn Lys Leu Val Lys Asp Pro
 225 230 235 240
 Pro Asn Val Gln Ile His Thr Ile Asp Gly Ser Ser Gly Val Ala Asn
 245 250 255
 Pro Ala Met Asp Pro Ile Tyr Asp Glu Pro Thr Thr Thr Ser Val
 260 265 270
 Pro Leu

<210> 11
 <211> 1096
 <212> DNA
 <213> CORONAVIRUS

<220>
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 <222> (558)..(1019)
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acacataaaac gaacttatgg atttggatgg a	tttggat caattactgc	180
acagccagta aaaattgaca atgcttctcc t	gcaagttact gttcatgcta cagcaacgat	240
accgctacaa gcctcaactcc ctttggatg g	cttggattt ggcgttgcatt ttcttgctgt	300
tttcagagc gctaccaaaa taattgcgt caataaaaga	tggcagctag cccttataaa	360
gggcttccag ttcatggca atttactgtc gctat	tttgcattt accatctatt cacatcttt	420
gcttgcgtc gcaggatgg aggcgcaatt tttg	tatgccttga tatattttct	480
acaatgcatt aacgcatgt a	gattattt gagatgttgg ctttggaa agtgcaa	540
caagaaccca ttactt atg atg cca act	tttgcgttggaa atgcacaa	590
Met Met Pro Thr Thr Leu Phe Ala Gly	Thr His	
1 5 10		
ata act atg act act gta tac cat	ata aca gtg tca cag ata caa ttg	638
Ile Thr Met Thr Thr Val Tyr His Ile	Thr Val Ser Gln Ile Gln Leu	
15 20 25		
tcg tta ctg aag gtg acg gca ttt	caa cac caa aac tca aag aag act	686
Ser Leu Leu Lys Val Thr Ala Phe Gln	His Gln Asn Ser Lys Lys Thr	
30 35 40		
acc aaa ttg gtg gtt att ctg agg	ata ggc act cag gtg tta aag act	734
Thr Lys Leu Val Val Ile Leu Arg Ile	Gly Thr Gln Val Leu Lys Thr	
45 50 55		
atg tcg ttg tac atg gct att tca	ccg aag ttt act acc agc ttg agt	782
Met Ser Leu Tyr Met Ala Ile Ser Pro	Lys Phe Thr Thr Ser Leu Ser	
60 65 70 75		
cta cac aaa tta cta cag aca ctg	gta ttg aaa atg cta cat tct tca	830
Leu His Lys Leu Gln Thr Leu Val Leu	Lys Met Leu His Ser Ser	
80 85 90		
tct tta aca agc ttg tta aag acc	cac cga atg tgc aaa tac aca caa	878
Ser Leu Thr Ser Leu Leu Lys Thr His	Arg Met Cys Lys Tyr Thr Gln	
95 100 105		
tcg acg gct ctt cag gag ttg cta	atc cag caa tgg atc caa ttt atg	926
Ser Thr Ala Leu Gln Glu Leu Ile	Gln Gln Trp Ile Gln Phe Met	
110 115 120		
atg agc cga cga cta cta gcg tgc	ctt tgt aag cac aag aaa gtg	974
Met Ser Arg Arg Arg Leu Leu Ala	Cys Leu Cys Lys His Lys Lys Val	
125 130 135		
agt acg aac tta tgt act cat	tcg ttt cgg aag aaa cag gta cgt	1019
Ser Thr Asn Leu Cys Thr His Ser Phe	Arg Lys Lys Gln Val Arg	
140 145 150		
taatagttaa tagcgtactt cttttcttg	ctttcggtt attcttgcta gtcacactag	1079
ccatccttac tgcgctt		1096

<210> 12

<211> 154

<212> PRT

<213> CORONAVIRUS

<400> 12

Met Met Pro Thr Thr Leu Phe Ala Gly Thr His Ile Thr Met Thr Thr

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Val Tyr His Ile Thr Val Ser Gln Ile Gln Leu Ser Leu Leu Lys Val

20 25 30

Thr Ala Phe Gln His Gln Asn Ser Lys Lys Thr Thr Lys Leu Val Val

35 40 45

Ile Leu Arg Ile Gly Thr Gln Val Leu Lys Thr Met Ser Leu Tyr Met

50 55 60

Ala Ile Ser Pro Lys Phe Thr Thr Ser Leu Ser Leu His Lys Leu Leu

65 70 75 80

Gln Thr Leu Val Leu Lys Met Leu His Ser Ser Ser Leu Thr Ser Leu

85 90 95

Leu Lys Thr His Arg Met Cys Lys Tyr Thr Gln Ser Thr Ala Leu Gln

100 105 110

Glu Leu Leu Ile Gln Gln Trp Ile Gln Phe Met Met Ser Arg Arg Arg
 115 120 125
 Leu Leu Ala Cys Leu Cys Lys His Lys Lys Val Ser Thr Asn Leu Cys
 130 135 140
 Thr His Ser Phe Arg Lys Lys Gln Val Arg
 145 150

<210> 13
 <211> 332
 <212> DNA
 <213> CORONAVIRUS

<220>
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 <222> (36)..(263)
 <223>

<400> 13

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Met Tyr Ser Phe Val Ser	
1 5	
gaa gaa aca ggt acg tta ata gtt aat acg gta ctt ctt ttt ctt gct	101
Glu Glu Thr Gly Thr Leu Ile Val Asn Ser Val Leu Leu Phe Leu Ala	
10 15 20	
ttc gtg gta ttc ttg cta gtc aca cta gcc atc ctt act gcg ctt cga	149
Phe Val Val Phe Leu Leu Val Thr Leu Ala Ile Leu Thr Ala Leu Arg	
25 30 35	
ttg tgt gcg tac tgc tgc aat att gtt aac gtg agt tta gta aaa cca	197
Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn Val Ser Leu Val Lys Pro	
40 45 50	
acg gtt tac gtc tac tcg cgt gtt aaa aat ctg aac tct tct gaa gga	245
Thr Val Tyr Val Tyr Ser Arg Val Lys Asn Leu Asn Ser Ser Glu Gly	
55 60 65 70	
gtt cct gat ctt ctg gtc taaacgaact aactattatt attattctgt	293
Val Pro Asp Leu Leu Val	
75	
ttgaaacttt aacatggctt atcatggcag acaacggta	332

<210> 14
 <211> 76
 <212> PRT
 <213> CORONAVIRUS

<400> 14

Met Tyr Ser Phe Val Ser Glu Glu Thr Gly Thr Leu Ile Val Asn Ser	
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Val Leu Leu Phe Leu Ala Phe Val Val Phe Leu Leu Val Thr Leu Ala	
20 25 30	
Ile Leu Thr Ala Leu Arg Leu Cys Ala Tyr Cys Cys Asn Ile Val Asn	
35 40 45	
Val Ser Leu Val Lys Pro Thr Val Tyr Val Tyr Ser Arg Val Lys Asn	
50 55 60	
Leu Asn Ser Ser Glu Gly Val Pro Asp Leu Leu Val	
65 70 75	

<210> 15
 <211> 332
 <212> DNA
 <213> CORONAVIRUS

<400> 15

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tcacactagc	catccttact	gcgcgtcgat	tgtgtcgta	ctgctgcaat	180
tgagtttagt	aaaaccaacg	gttacgtct	actcgcgtgt	aaaaaatctg	240
aaggagttcc	tgatcttctg	gtctaaacga	actaactatt	attattattc	300
tttaacattg	cttacatgg	cagacaacgg	ta		332
<210> 16					
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<212> DNA					
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<223>					
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				Met Ala Asp Asn Gly	
				1 5	
act att acc gtt gag gag	ctt aaa caa ctc	ctg gaa caa	tgg aac cta		103
Thr Ile Thr Val Glu Glu	Leu Lys Gln Leu	Leu Glu Gln	Trp Asn Leu		
10	15	20			
gta ata ggt ttc cta ttc	cta gcc tgg att atg	tta cta caa	ttt gcc		151
Val Ile Gly Phe Leu Phe	Leu Ala Trp Ile	Met Leu Leu	Gln Phe Ala		
25	30	35			
tat tct aat cgg aac agg	ttt ttg tac ata	ata aag ctt	gtt ttc ctc		199
Tyr Ser Asn Arg Asn Arg	Phe Leu Tyr Ile	Ile Lys Leu	Val Phe Leu		
40	45	50			
tgg ctc ttg tgg cca gta	aca ctt gct tgg	ttt gtg ctt	gct gtc		247
Trp Leu Leu Trp Pro Val	Thr Leu Ala Cys	Phe Val Leu Ala	Ala Val		
55	60	65			
tac aga att aat tgg	gtg act ggc ggg	att gca atg	gct tgt		295
Tyr Arg Ile Asn Trp Val	Thr Gly Gly Ile	Ala Ile Ala	Met Ala Cys		
70	75	80	85		
att gta ggc ttg atg	tgg ctt agc tac	ttc gtt gct	tcc ttc	agg ctg	343
Ile Val Gly Leu Met Trp	Leu Ser Tyr Phe	Val Ala Ser Phe	Arg Leu		
90	95	100			
ttt gct cgt acc cgc tca	atg tgg tca	ttc aac cca	gaa aca	aac att	391
Phe Ala Arg Thr Arg Ser	Met Trp Ser Phe	Asn Pro Glu	Thr Asn Ile		
105	110	115			
ctt ctc aat gtg cct ctc	cgg ggg aca att	gtg acc aga	ccg ctc atg		439
Leu Leu Asn Val Pro Leu	Arg Gly Thr Ile	Val Thr Arg	Pro Leu Met		
120	125	130			
gaa agt gaa ctt gtc	att ggt gct gtg	atc att cgt	ggt cac ttg	cga	487
Glu Ser Glu Leu Val Ile	Gly Ala Val Ile	Ile Arg Gly	His Leu Arg		
135	140	145			
atg gcc gga cac tcc	cta ggg cgc tgg	gac att aag	gac ctg cca	aaa	535
Met Ala Gly His Ser	Leu Gly Arg Cys	Asp Ile Lys	Asp Leu Pro	Lys	
150	155	160	165		
gag atc act gtg gct	aca tca cga acg	ctt tct tat	tac aaa tta	gga	583
Glu Ile Thr Val Ala	Thr Ser Arg Thr	Leu Ser Tyr	Tyr Lys Leu	Gly	
170	175	180			
gcg tcg cag cgt gta	ggc act gat tca	ggt ttt gct	gca tac aac	cgc	631
Ala Ser Gln Arg Val	Gly Thr Asp Ser	Gly Phe Ala	Ala Tyr	Asn Arg	
185	190	195			
tac cgt att gga aac	tat aaa tta aat	aca gac cac	gcc ggt	agc aac	679
Tyr Arg Ile Gly Asn	Tyr Lys Leu Asn	Thr Asp His	Ala Gly	Ser Asn	
200	205	210			
gac aat att gct ttg	cta gta cag	taagt			708
Asp Asn Ile Ala	Leu Leu Val	Gln			
215	220				

<210> 17
 <211> 221
 <212> PRT
 <213> CORONAVIRUS

<400> 17

Met	Ala	Asp	Asn	Gly	Thr	Ile	Thr	Val	Glu	Glu	Leu	Lys	Gln	Leu	Leu
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Glu	Gln	Trp	Asn	Leu	Val	Ile	Gly	Phe	Leu	Phe	Leu	Ala	Trp	Ile	Met
						20			25						30
Leu	Leu	Gln	Phe	Ala	Tyr	Ser	Asn	Arg	Asn	Arg	Phe	Leu	Tyr	Ile	Ile
						35			40						45
Lys	Leu	Val	Phe	Leu	Trp	Leu	Leu	Trp	Pro	Val	Thr	Leu	Ala	Cys	Phe
						50			55						60
Val	Leu	Ala	Ala	Val	Tyr	Arg	Ile	Asn	Trp	Val	Thr	Gly	Gly	Ile	Ala
						65			70			75			80
Ile	Ala	Met	Ala	Cys	Ile	Val	Gly	Leu	Met	Trp	Leu	Ser	Tyr	Phe	Val
						85			90						95
Ala	Ser	Phe	Arg	Leu	Phe	Ala	Arg	Thr	Arg	Ser	Met	Trp	Ser	Phe	Asn
						100			105						110
Pro	Glu	Thr	Asn	Ile	Leu	Leu	Asn	Val	Pro	Leu	Arg	Gly	Thr	Ile	Val
						115			120						125
Thr	Arg	Pro	Leu	Met	Glu	Ser	Glu	Leu	Val	Ile	Gly	Ala	Val	Ile	Ile
						130			135						140
Arg	Gly	His	Leu	Arg	Met	Ala	Gly	His	Ser	Leu	Gly	Arg	Cys	Asp	Ile
						145			150			155			160
Lys	Asp	Leu	Pro	Lys	Glu	Ile	Thr	Val	Ala	Thr	Ser	Arg	Thr	Leu	Ser
						165			170						175
Tyr	Tyr	Lys	Leu	Gly	Ala	Ser	Gln	Arg	Val	Gly	Thr	Asp	Ser	Gly	Phe
						180			185						190
Ala	Ala	Tyr	Asn	Arg	Tyr	Arg	Ile	Gly	Asn	Tyr	Lys	Leu	Asn	Thr	Asp
						195			200						205
His	Ala	Gly	Ser	Asn	Asp	Asn	Ile	Ala	Leu	Leu	Val	Gln			
						210			215						220

<210> 18
 <211> 769
 <212> DNA
 <213> CORONAVIRUS

<400> 18

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tgcttatcat	ggcagacaac	ggtactatta	ccgttggagga	gcttaaaca	ctcctggaa	120
aatggAACCT	agtaataggt	ttccttattcc	tagcctggat	tatgttacta	caatttgcct	180
attctaatcg	gaacagggtt	ttgtacataa	taaagcttgc	tttcctctgg	ctcttggc	240
cagtaacact	tgcttgc	ttttgttgc	ctgtctacag	aattaattgg	gtgactggcg	300
ggattgcgt	tgcaatggct	tgtattgttag	gcttgcgt	gcttagctac	ttcggtgc	360
ccttcaggct	gtttgcgt	acccgcctaa	tgtggcatt	caacccagaa	acaaacattc	420
ttctcaatgt	gcctcccg	gggacaatttgc	tgaccagacc	gctcatggaa	agtgaacttg	480
tcattgggtgc	tgtgtcatt	cgtggcact	tgcaatggc	cggacactcc	ctagggcgct	540
gtgacattaa	ggacctgcca	aaagagatca	ctgtggcatt	atcacgaacg	cttgcatt	600
acaaaatttgc	agcgtcgac	cgtgttaggca	ctgattcagg	ttttgcgtca	tacaaccgct	660
accgtattgg	aaactataaa	ttaaatacag	accacgcccgg	tagcaacgac	aatattgctt	720
tgcttagtaca	gtaagtgaca	acagatgtt	catcttgc	acttccagg		769

<210> 19
 <211> 1231
 <212> DNA
 <213> CORONAVIRUS

<400> 19

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ttgcttagtac	agtaagtac	aacagatgtt	tcatcttgc	gacttccagg	ttacaatgc	120
agagatattt	attatcatta	tgaggactt	caggattgc	atttggaaatc	ttgacgttat	180
aataagttca	atagtggagac	aattattttaa	gcctctaact	aagaagaatt	atccggagtt	240
agatgatgaa	gaacctatgg	agtttagatta	tccataaaac	gaacatgaaa	attattctct	300
tcctgacatt	gattgttattt	acatcttgcg	agctatatca	ctatcaggag	tgtgttagag	360
gtacgactgt	actactaaaa	gaaccttgc	catcaggaac	atacgaggc	aattcaccat	420
ttcacccctc	tgctgacaat	aaatttgcac	taacttgcac	tagcacacac	tttgcttttg	480
cttgcgtga	cggtaactcga	catacctatc	agctgcgtgc	aagatcagtt	tcacccaaac	540
ttttcatca	acaagaggag	gttcaacaag	agctctactc	gccactttt	ctcattgttg	600
ctgctctagt	attttaata	ctttgcttca	ccattaagag	aaagacagaa	tgaatgagct	660
cacttaatt	gacttctatt	tgtgctttt	agccttctg	ctattcctt	tttaataat	720
gcttattata	ttttgctttt	cactcgaaat	ccaggatcta	gaagaacctt	gtacccaaagt	780
ctaaacgaac	atgaaacttc	tcattgttt	gacttgtatt	tctctatgca	gtgcataatg	840
cactgttagta	cagcgtgtg	catctaataa	acccatgtg	cttgaagatc	cttgcagg	900
acaacactag	gggttaatact	tatagcactg	cttggcttt	tgctctagga	aaggttttac	960
ctttcata	atggcacact	atggttcaaa	catgcacacc	taatgttact	atcaactgtc	1020
aagatccagc	ttgtgtgcg	cttatacgta	gggttggta	ccttcatgaa	ggtcacccaaa	1080
ctgctgcatt	tagagacgta	cttggtttt	taaataaaacg	aacaattaa	aatgtctgat	1140
aatggacccc	aatcaaacca	acgtatgtcc	ccccgcatta	catttgggt	acccacagat	1200
tcaactgaca	ataaccagaa	tggaggacgc	a			1231

<210> 20

<211> 1242

<212> DNA

<213> CORONAVIRUS

<400> 20

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gacaatattt	ctttgctagt	acagtaagt	acaacagat	tttcatctt	ttgacttcca	120
ggttacaata	gcagagat	tgattatcat	tatgaggact	ttcaggattt	ctatttggaa	180
tcttgcgtt	ataataagtt	caatagttag	acagtttattt	aaggccttaa	ctaagaagaa	240
ttattcggag	ttagatgat	aagaacctat	ggagtttagat	tatccataaa	acgaacatga	300
aaattattct	tttcctgaca	ttgattgtat	ttacatctt	cgagctata	cactatcagg	360
agtgtgttag	aggtacgact	gtactactaa	aagaacctt	cccatcagga	acatacgagg	420
gcaattcacc	atttcaccct	cttgctgaca	ataaaatttgc	actaacttgc	actagcacac	480
actttgc	ttgttgcgt	gacggtaactc	gacataccta	tcagctgcgt	gcaagatcag	540
tttcacccaa	actttcata	agacaagagg	aggttcaaca	agagcttac	tcgcccactt	600
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tgttttaata	atgcttatta	tattttgg	ttcactcgaa	atccagatc	tagaagaacc	780
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cagttgcata	tgcaactgt	taacgcgt	tgcatctaa	aaacctcatg	tgcttgaaga	900
tccttgc	gtacaacact	agggtaata	cttatacgac	tgcttgc	tgtgctctag	960
gaaagg	tttac	agatggcaca	ctatggttca	aacatgcaca	cctaatagtt	1020
ctatcaactg	tcaagatcca	gctgggtgg	cgcttata	taggtgttgg	tacatttcatg	1080
aagg	tcacca	aactgtgc	tttagagacg	tacttgc	tttaataaaa	cgAACGAATT
aaaatgtctg	ataatggacc	ccaatcaa	caacgtatgt	ccccccgc	tacatttgc	1140
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<210> 21

<211> 1231

<212> DNA

<213> CORONAVIRUS

<220>

<221> CDS

<222> (86)..(274)

<223>

<400> 21

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ttgctagtac agtaagtgac aacag atg ttt cat ctt gtt gac ttc cag gtt	112
Met Phe His Leu Val Asp Phe Gln Val	
1 5	
aca ata gca gag ata ttg att atc att atg agg act ttc agg att gct	160
Thr Ile Ala Glu Ile Leu Ile Ile Met Arg Thr Phe Arg Ile Ala	
10 15 20 25	
att tgg aat ctt gac gtt ata ata agt tca ata gtg aga caa tta ttt	208
Ile Trp Asn Leu Asp Val Ile Ile Ser Ser Ile Val Arg Gln Leu Phe	
30 35 40	
aag cct cta act aag aag aat tat tcg gag tta gat gat gaa gaa cct	256
Lys Pro Leu Thr Lys Asn Tyr Ser Glu Leu Asp Asp Glu Glu Pro	
45 50 55	
atg gag tta gat tat cca taaaacgaac atgaaaattt ttctttcct	304
Met Glu Leu Asp Tyr Pro	
60	
gacattgatt gtatttacat cttgcgagct atatcactat caggagtgtg tttagaggtac	364
gactgtacta ctaaaaagaac cttgcccattt aggaacatac gagggcaatt caccattca	424
ccctcttgcgt gacaataaat ttgcactaac ttgcactagc acacactttt cttttgcctt	484
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gaccggcaatc aaaccaacgt agtgcggcccc gcattacatt tggggaccc acagattcaa	1204
ctgacaataa ccagaatgga ggacgca	1231

<210> 22
 <211> 63
 <212> PRT
 <213> CORONAVIRUS

<400> 22
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 Ile Ser Ser Ile Val Arg Gln Leu Phe Lys Pro Leu Thr Lys Lys Asn
 35 40 45
 Tyr Ser Glu Leu Asp Asp Glu Glu Pro Met Glu Leu Asp Tyr Pro
 50 55 60

<210> 23
 <211> 1231
 <212> DNA
 <213> CORONAVIRUS

<220>
 <221> CDS
 <222> (285)..(650)
 <223>

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 agagatattt attatcatta tgaggacttt caggattgtt atttggaaatc ttgacgttat 180
 aataagttca atagtgagac aattattttaa gcctctaact aagaagaattt attcggagtt 240

agatgatgaa	gaacctatgg	agttagatta	tccataaaac	gaac	atg	aaa	att	att	296							
					Met	Lys	Ile	Ile								
					1											
ctc	tgc	aca	ttg	att	gta	ttt	aca	tct	tgc	gag	cta	tat	cac	tat	344	
Leu	Phe	Leu	Thr	Leu	Ile	Val	Phe	Thr	Ser	Cys	Glu	Leu	Tyr	His	Tyr	
5					10					15			20			
cag	gag	tgt	gtt	aga	ggt	acg	act	gta	cta	aaa	gaa	cct	tgc	cca	392	
Gln	Glu	Cys	Val	Arg	Gly	Thr	Thr	Val	Leu	Leu	Lys	Glu	Pro	Cys	Pro	
					25					30			35			
tca	gga	aca	tac	gag	ggc	aat	tca	cca	ttt	cac	cct	ctt	gct	gac	440	
Ser	Gly	Thr	Tyr	Glu	Gly	Asn	Ser	Pro	Phe	His	Pro	Phe	Leu	Ala	Asp	Asn
					40					45			50			
aaa	ttt	gca	cta	act	tgc	act	agc	aca	cac	ttt	gct	ttt	gct	tgt	488	
Lys	Phe	Ala	Leu	Thr	Cys	Thr	Ser	Thr	His	Phe	Ala	Phe	Ala	Cys	Ala	
					55					60			65			
gac	ggt	act	cga	cat	acc	tat	cag	ctg	cgt	gca	aga	tca	gtt	tca	536	
Asp	Gly	Thr	Arg	His	Thr	Tyr	Gln	Leu	Arg	Ala	Arg	Ser	Val	Ser	Pro	
					70					75			80			
aaa	ctt	ttc	atc	aga	caa	gag	gag	gtt	caa	caa	gag	ctc	tac	tcg	584	
Lys	Leu	Phe	Ile	Arg	Gln	Glu	Glu	Val	Gln	Gln	Glu	Leu	Tyr	Ser	Pro	
					85					90			95		100	
ctt	ttt	ctc	att	gtt	gct	gct	cta	gta	ttt	tta	ata	ctt	tgc	ttc	632	
Leu	Phe	Leu	Ile	Ala	Ala	Leu	Val	Phe	Leu	Ile	Leu	Cys	Phe	Thr		
					105					110			115			
att	aag	aga	aag	aca	gaa	tgaatgagct	cacttaatt	gacttctatt							680	
Ile	Lys	Arg	Lys	Thr	Glu											
					120											
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tatagcactg	cttggctttg	tgctctagga	aaggttttac	cttttcatacg	atggcacact										980	
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tggaggacgc	a														1231	

<210> 24

<211> 122

<212> PRT

<213> CORONAVIRUS

<400> 24

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Leu	Tyr	His	Tyr	Gln	Glu	Cys	Val	Arg	Gly	Thr	Thr	Val	Leu	Leu	Lys
					20				25			30			
Glu	Pro	Cys	Pro	Ser	Gly	Thr	Tyr	Glu	Gly	Asn	Ser	Pro	Phe	His	Pro
					35				40			45			
Leu	Ala	Asp	Asn	Lys	Phe	Ala	Leu	Thr	Cys	Thr	Ser	Thr	His	Phe	Ala
					50				55			60			
Phe	Ala	Cys	Ala	Asp	Gly	Thr	Arg	His	Thr	Tyr	Gln	Leu	Arg	Ala	Arg
					65				70			75			80
Ser	Val	Ser	Pro	Lys	Leu	Phe	Ile	Arg	Gln	Glu	Val	Gln	Gln	Glu	
					85				90			95			
Leu	Tyr	Ser	Pro	Leu	Phe	Leu	Ile	Val	Ala	Ala	Leu	Val	Phe	Leu	Ile
					100				105			110			
Leu	Cys	Phe	Thr	Ile	Lys	Arg	Lys	Thr	Glu						
					115				120						

<210> 25
<211> 1231
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS
<222> (650)..(781)
<223>

<210> 26
<211> 44
<212> PRT
<213> CORONAVIRUS

<400> 26
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 Leu Leu Phe Leu Val Leu Ile Met Leu Ile Ile Phe Trp Phe Ser Leu
 20 25 30
 Glu Ile Gln Asp Leu Glu Glu Pro Cys Thr Lys Val
 35 40

<210> 27
<211> 1231
<212> DNA
<213> CORONAVIRUS

<220>
<221> CDS

<222> (791)..(907)

<223>

<400> 27

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agagatattt	attatcatta	tgaggactt	caggattgct	atttggaaatc	ttgacgttat	180										
aataagttca	atagtggagac	aattatttaa	gcctctaact	aagaagaatt	atcggaggt	240										
agatgtgaa	gaacctatgg	agtttagatta	tccataaaac	gaacatgaaa	attattctct	300										
tcctgacatt	gattgtattt	acatcttgc	agctatatac	ctatcaggag	tgtgttagag	360										
gtacgactgt	actactaaaa	gaaccttgcc	catcaggaac	atacgagggc	aattcaccat	420										
ttcacccctct	tgctgacaat	aaatttgcac	taacttgcac	tagcacacac	tttgctttt	480										
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ctgctctagt	attttaata	cttgcttca	ccattaagag	aaagacagaa	tgaatgagct	660										
cacttaatt	gacttctatt	tgtgctttt	agccttctg	ctattccttg	tttaataat	720										
gcttattata	tttggtttt	cactcgaaat	ccaggatcta	gaagaacctt	gtacccaaagt	780										
ctaaacgaac	atg	aaa	ctt	ctc	att	gtt	act	tgt	att	tct	cta	tgc	829			
	Met	Lys	Leu	Leu	Ile	Val	Leu	Thr	Cys	Ile	Ser	Leu	Cys			
	1				5					10						
agt	tgc	ata	tgc	act	gta	gta	cag	cgc	tgt	gca	tct	aat	aaa	cct	cat	877
Ser	Cys	Ile	Cys	Thr	Val	Val	Gln	Arg	Cys	Ala	Ser	Asn	Lys	Pro	His	
15					20					25						
gtg	ctt	gaa	gat	cct	tgt	aag	gta	caa	cac	tagggtaat	acttata	actagca				927
Val	Leu	Glu	Asp	Pro	Cys	Lys	Val	Gln	His							
30					35											
ctgcttggct	ttgtgctct	ggaaagggtt	tacctttca	tagatggcac	actatggttc											987
aaacatgcac	acctaattgtt	actatcaact	gtcaagatcc	agctgggtt	gcgccttatag											1047
ctaggtgtt	gtaccttcat	gaaggtcacc	aaactgctgc	atttagagac	gtacttgg											1107
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gccccccgca	ttacatttgg	tggaccacac	gattcaactg	acaataacca	aatggagga											1227
cgca																1231

<210> 28

<211> 39

<212> PRT

<213> CORONAVIRUS

<400> 28

Met	Lys	Leu	Leu	Ile	Val	Leu	Thr	Cys	Ile	Ser	Leu	Cys	Ser	Cys	Ile
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Cys	Thr	Val	Val	Gln	Arg	Cys	Ala	Ser	Asn	Lys	Pro	His	Val	Leu	Glu
20					25					30					
Asp	Pro	Cys	Lys	Val	Gln	His									
35															

<210> 29

<211> 1231

<212> DNA

<213> CORONAVIRUS

<220>

<221> CDS

<222> (876)..(1127)

<223>

<400> 29

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agagatattt	attatcatta	tgaggactt	caggattgct	atttggaaatc	ttgacgttat	180
aataagttca	atagtggagac	aattatttaa	gcctctaact	aagaagaatt	atcggaggt	240
agatgtgaa	gaacctatgg	agtttagatta	tccataaaac	gaacatgaaa	attattctct	300

tcctgacatt gattgtattt acatcttgcg agctatatca ctatcaggag tggtagag	360
gtacgactgt actactaaaa gaaccttgc catcaggaac atacgaggc aattcaccat	420
ttcacccctct tgctgacaat aaatttgcac taacttgcac tagcacacac tttgtttt	480
cttgcgtga cggtaactcga catacctatc agctgcgtgc aagatcagtt tcaccaaaac	540
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ctgctctagt attttaata ctttgcattca ccattaagag aaagacagaa tgaatgagct	660
cacttaatt gacttctatt tttgcattt agccttctg ctattcattt tttataataat	720
gttattata ttttgcattt cactcgaaat ccaggatcta gaagaacctt gtaccaaagt	780
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cactgttagta cagcgctgtg catctaataa acctc atg tgc ttg aag atc ctt	893
Met Cys Leu Lys Ile Leu	
1 5	

gta agg tac aac act agg ggt aat act tat agc act gct tgg ctt ttt	941
Val Arg Tyr Asn Thr Arg Gly Asn Thr Tyr Ser Thr Ala Trp Leu Cys	
10 15 20	
gct cta gga aag gtt tta cct ttt cat aga tgg cac act atg gtt caa	989
Ala Leu Gly Lys Val Leu Pro Phe His Arg Trp His Thr Met Val Gln	
25 30 35	
aca tgc aca cct aat gtt act atc aac ttt ctt ctt gaa ggt cac caa act gct	1037
Thr Cys Thr Pro Asn Val Thr Ile Asn Cys Gln Asp Pro Ala Gly Gly	
40 45 50	
gct ctt ata gct agg ttt tgg tac ctt cat gaa ggt cac caa act gct	1085
Ala Leu Ile Ala Arg Cys Trp Tyr Leu His Glu Gly His Gln Thr Ala	
55 60 65 70	
gca ttt aga gac gta ctt gtt tta aat aaa cga aca aat	1127
Ala Phe Arg Asp Val Leu Val Leu Asn Lys Arg Thr Asn	
75 80	
taaaatgtct gataatggac cccaatcaaa ccaacgtgtt gccccccgca ttacatttgg	1187
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<210> 30
 <211> 84
 <212> PRT
 <213> CORONAVIRUS

<400> 30
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 Ser Thr Ala Trp Leu Cys Ala Leu Gly Lys Val Leu Pro Phe His Arg
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 Trp His Thr Met Val Gln Thr Cys Thr Pro Asn Val Thr Ile Asn Cys
 35 40 45
 Gln Asp Pro Ala Gly Gly Ala Leu Ile Ala Arg Cys Trp Tyr Leu His
 50 55 60
 Glu Gly His Gln Thr Ala Ala Phe Arg Asp Val Leu Val Val Leu Asn
 65 70 75 80
 Lys Arg Thr Asn

<210> 31
 <211> 21221
 <212> DNA
 <213> CORONAVIRUS

<400> 31
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 <212> DNA
 <213> CORONAVIRUS

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 aaggtttacc caataatact gcgtcttgc tcacagctt cactcagcat ggcaaggagg 180
 aacttagatt ccctcgaggc cagggcggtc caatcaacac caatagtggt ccagatgacc 240
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<210> 33
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 <213> CORONAVIRUS

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 35 40 45

Leu Gly Ser Gln Leu Ser Leu Ser Met Ala Arg Arg Asn Leu Asp Ser
 50 55 60
 Leu Glu Ala Arg Ala Phe Gln Ser Thr Pro Ile Val Val Gln Met Thr
 65 70 75 80
 Lys Leu Ala Thr Thr Glu Glu Leu Pro Asp Glu Phe Val Val Val Thr
 85 90 95
 Ala Lys

<210> 34
 <211> 213
 <212> DNA
 <213> CORONAVIRUS

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 caagaaattc aactctggc agcagtaggg gaaattctcc tgctcgaatg gctagcggag 180
 gtggtaaac tgccctcgcg ctattgctgc tag 213

<210> 35
 <211> 70
 <212> PRT
 <213> CORONAVIRUS

<400> 35
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 Ala Ser Thr Gln Arg Glu Ala Glu Ala Ala Val Lys Pro Leu Leu Ala
 20 25 30
 Pro His His Val Val Ala Val Ile Gln Glu Ile Gln Leu Leu Ala Ala
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 Val Gly Glu Ile Leu Leu Leu Glu Trp Leu Ala Glu Val Val Lys Leu
 50 55 60
 Pro Ser Arg Tyr Cys Cys
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<210> 36
 <211> 1377
 <212> DNA
 <213> CORONAVIRUS

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 Met Ser Asp Asn Gly Pro Gln Ser Asn Gln Arg Ser Ala Pro
 1 5 10
 cgc att aca ttt ggt gga ccc aca gat tca act gac aat aac cag aat 156
 Arg Ile Thr Phe Gly Gly Pro Thr Asp Ser Thr Asp Asn Asn Gln Asn
 15 20 25 30
 gga gga cgc aat ggg gca agg cca aaa cag cgc cga ccc caa ggt tta 204
 Gly Gly Arg Asn Gly Ala Arg Pro Lys Gln Arg Arg Pro Gln Gly Leu
 35 40 45
 ccc aat aat act gcg tct tgg ttc aca gct ctc act cag cat ggc aag 252
 Pro Asn Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys
 50 55 60

gag gaa ctt aga ttc cct cga ggc cag ggc gtt cca atc aac acc aat	300
Glu Glu Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn	
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Ser Gly Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg	
80 85 90	
gtt cgt ggt ggt gac ggc aaa atg aaa gag ctc agc ccc aga tgg tac	396
Val Arg Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr	
95 100 105 110	
tcc tat tac cta gga act ggc cca gaa gct tca ctt ccc tac ggc gct	444
Phe Tyr Tyr Leu Gly Thr Gly Pro Glu Ala Ser Leu Pro Tyr Gly Ala	
115 120 125	
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Asn Lys Glu Gly Ile Val Trp Val Ala Thr Glu Gly Ala Leu Asn Thr	
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Pro Lys Asp His Ile Gly Thr Arg Asn Pro Asn Asn Asn Ala Ala Thr	
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Val Leu Gln Leu Pro Gln Gly Thr Thr Leu Pro Lys Gly Phe Tyr Ala	
160 165 170	
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Glu Gly Ser Arg Gly Ser Gln Ala Ser Ser Arg Ser Ser Arg	
175 180 185 190	
agt cgc ggt aat tca aga aat tca act cct ggc agc agt agg gga aat	684
Ser Arg Gly Asn Ser Arg Asn Ser Thr Pro Gly Ser Ser Arg Gly Asn	
195 200 205	
tct cct gct cga atg gct agc gga ggt ggt gaa act gcc ctc gcg cta	732
Ser Pro Ala Arg Met Ala Ser Gly Gly Glu Thr Ala Leu Ala Leu	
210 215 220	
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Leu Leu Leu Asp Arg Leu Asn Gln Leu Glu Ser Lys Val Ser Gly Lys	
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ggc caa caa caa ggc caa act gtc act aag aaa tct gct gct gag	828
Gly Gln Gln Gln Gly Gln Thr Val Thr Lys Lys Ser Ala Ala Glu	
240 245 250	
gca tct aaa aag cct cgc caa aaa cgt act gcc aca aaa cag tac aac	876
Ala Ser Lys Lys Pro Arg Gln Lys Arg Thr Ala Thr Lys Gln Tyr Asn	
255 260 265 270	
gtc act caa gca ttt ggg aga cgt ggt cca gaa caa acc caa gga aat	924
Val Thr Gln Ala Phe Gly Arg Arg Gly Pro Glu Gln Thr Gln Gly Asn	
275 280 285	
tcc ggg gac caa gac cta atc aga caa gga act gat tac aaa cat tgg	972
Phe Gly Asp Gln Asp Leu Ile Arg Gln Gly Thr Asp Tyr Lys His Trp	
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Pro Gln Ile Ala Gln Phe Ala Pro Ser Ala Ser Ala Phe Phe Gly Met	
305 310 315	
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Ser Arg Ile Gly Met Glu Val Thr Pro Ser Gly Thr Trp Leu Thr Tyr	
320 325 330	
cat gga gcc att aaa ttg gat gac aaa gat cca caa ttc aaa gac aac	1116
His Gly Ala Ile Lys Leu Asp Asp Lys Asp Pro Gln Phe Lys Asp Asn	
335 340 345 350	
gtc ata ctg ctg aac aag cac att gac gca tac aaa aca ttc cca cca	1164
Val Ile Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro	
355 360 365	
aca gag cct aaa aag gac aaa aag aaa aag act gat gaa gct cag cct	1212
Thr Glu Pro Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro	
370 375 380	

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Leu Pro Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala	
385 390 395	
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Ala Asp Met Asp Asp Phe Ser Arg Gln Leu Gln Asn Ser Met Ser Gly	
400 405 410	
gct tct gct gat tca act cag gca taa acactcatga tgaccacaca	1355
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<210> 37
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 <212> PRT
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35 40 45	
Asn Thr Ala Ser Trp Phe Thr Ala Leu Thr Gln His Gly Lys Glu Glu	
50 55 60	
Leu Arg Phe Pro Arg Gly Gln Gly Val Pro Ile Asn Thr Asn Ser Gly	
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Pro Asp Asp Gln Ile Gly Tyr Tyr Arg Arg Ala Thr Arg Arg Val Arg	
85 90 95	
Gly Gly Asp Gly Lys Met Lys Glu Leu Ser Pro Arg Trp Tyr Phe Tyr	
100 105 110	
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115 120 125	
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260 265 270	
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325 330 335	
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340 345 350	

Leu Leu Asn Lys His Ile Asp Ala Tyr Lys Thr Phe Pro Pro Thr Glu
 355 360 365
 Pro Lys Lys Asp Lys Lys Lys Lys Thr Asp Glu Ala Gln Pro Leu Pro
 370 375 380
 Gln Arg Gln Lys Lys Gln Pro Thr Val Thr Leu Leu Pro Ala Ala Asp
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 405 410 415
 Ala Asp Ser Thr Gln Ala
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<210> 38
 <211> 1377
 <212> DNA
 <213> CORONAVIRUS

<400> 38

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<210> 39

<211> 204
 <212> DNA
 <213> CORONAVIRUS

<400> 39

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<210> 40

<211> 809
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<400> 40

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gcctctgcatt tctttggat gtcacgcatt ggcataggc	tcacacccat gggacatgg	180
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<210> 41
<211> 448
<212> DNA
<213> CORONAVIRUS

<400> 41						
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ggacgaggt	actcg	tttgcgttct	tgtcaacgcac	agtaaaaattt	attattgttt	360
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<210> 42
<211> 2033
<212> DNA
<213> CORONAVIRUS

<400> 42						
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<210> 43

<211> 2018

<212> DNA

<213> CORONAVIRUS

<400> 43

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<210> 44

<211> 1442

<212> DNA

<213> CORONAVIRUS

<400> 44

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<210> 45

<211> 1050

<212> DNA

<213> CORONAVIRUS

<400> 45

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<210> 46

<211> 1995

<212> DNA

<213> CORONAVIRUS

<400> 46

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<210> 47

<211> 1884

<212> DNA

<213> CORONAVIRUS

<400> 47

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<210> 48

<211> 2020

<212> DNA

<213> CORONAVIRUS

<400> 48

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tattattgccc	atattggtga	cttgcgtgc	ctactacttt	atgaaattca	gacgtgtttt	360
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gtcaagaaa	attgttaagg	gcactcatca	ttggatgctt	ttaacttct	tgacatcact	1920
attgattctt	gttcaaaatg	cacagtggc	actgttttgc	tttgcgttac	agaatgtctt	1980
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<210> 49

<211> 2040

<212> DNA

<213> CORONAVIRUS

<400> 49

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accagccgca	caggacatct	gtcgttagtgc	tactggactc	agttcattat	tctgtatgtt	360
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gcacaagaat	gcgtgcttat	gcttaacaag	cagcatagca	catgcagcaa	ttgccataat	1920
accaagagta	aatggcaaga	aagcattctc	gttaaacaag	aaaaacagt	accactgtgt	1980
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<210> 50

<211> 2012

<212> DNA

<213> CORONAVIRUS

<400> 50

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gccaacaatg	tgtgtatca	gacaactctt	attcgttagtt	gaagttgttg	ataaataactt	1980
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<210> 51

<211> 1877

<212> DNA

<213> CORONAVIRUS

<400> 51

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<210> 52

<211> 2051

<212> DNA

<213> CORONAVIRUS

<400> 52

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<210> 53

<211> 2075

<212> DNA

<213> CORONAVIRUS

<400> 53

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 cgatacatag tctactcttg tgcagaatga attctcgtaa ctaaacagca caagtaggtt 180
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 35 40 45
 Gly Thr Cys Gly Leu Val Glu Leu Glu Lys Gly Val Leu Pro Gln Leu
 50 55 60
 Glu Gln Pro Tyr Val Phe Ile Lys Arg Ser Asp Ala Leu Ser Thr Asn
 65 70 75 80
 His Gly His Lys Val Val Glu Leu Val Ala Glu Met Asp Gly Ile Gln
 85 90 95
 Tyr Gly Arg Ser Gly Ile Thr Leu Gly Val Leu Val Pro His Val Gly
 100 105 110

Glu Thr Pro Ile Ala Tyr Arg Asn Val Leu Leu Arg Lys Asn Gly Asn
 115 120 125
 Lys Gly Ala Gly Gly His Ser Tyr Gly Ile Asp Leu Lys Ser Tyr Asp
 130 135 140
 Leu Gly Asp Glu Leu Gly Thr Asp Pro Ile Glu Asp Tyr Glu Gln Asn
 145 150 155 160
 Trp Asn Thr Lys His Gly Ser Gly Ala Leu Arg Glu Leu Thr Arg Glu
 165 170 175
 Leu Asn Gly Gly Ala Val Thr Arg Tyr Val Asp Asn Asn Phe Cys Gly
 180 185 190
 Pro Asp Gly Tyr Pro Leu Asp Cys Ile Lys Asp Phe Leu Ala Arg Ala
 195 200 205
 Gly Lys Ser Met Cys Thr Leu Ser Glu Gln Leu Asp Tyr Ile Glu Ser
 210 215 220
 Lys Arg Gly Val Tyr Cys Cys Arg Asp His Glu His Glu Ile Ala Trp
 225 230 235 240
 Phe Thr Glu Arg Ser Asp Lys Ser Tyr Glu His Gln Thr Pro Phe Glu
 245 250 255
 Ile Lys Ser Ala Lys Lys Phe Asp Thr Phe Lys Gly Glu Cys Pro Lys
 260 265 270
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 290 295 300
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 325 330 335
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 355 360 365
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 Gly Asp Phe His Leu Asn Glu Glu Val Ala Ile Ile Leu Ala Ser Phe
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 Pro Val Asp Ser Phe Thr Asn Gly Ala Ile Val Gly Thr Pro Val Cys
 770 775 780
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 850 855 860
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 Val Lys Thr Leu Gln Pro Val Ser Asp Leu Leu Thr Asn Met Gly Ile
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 Pro Leu Glu Phe Gly Ala Ser Ala Glu Thr Val Arg Val Glu Glu Glu
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Ala	Ser	Phe	Lys	Lys	Gly	Ala	Lys	Leu	Leu	His	Lys	Pro	Ile	Val
	1955				1960						1965			
Trp	His	Ile	Asn	Gln	Ala	Thr	Thr	Lys	Thr	Thr	Phe	Lys	Pro	Asn
	1970				1975						1980			
Thr	Trp	Cys	Leu	Arg	Cys	Leu	Trp	Ser	Thr	Lys	Pro	Val	Asp	Thr
	1985				1990						1995			
Ser	Asn	Ser	Phe	Glu	Val	Leu	Ala	Val	Glu	Asp	Thr	Gln	Gly	Met
	2000				2005						2010			
Asp	Asn	Leu	Ala	Cys	Glu	Ser	Gln	Gln	Pro	Thr	Ser	Glu	Glu	Val
	2015				2020						2025			

Val	Glu	Asn	Pro	Thr	Ile	Gln	Lys	Glu	Val	Ile	Glu	Cys	Asp	Val
2030						2035					2040			
Lys	Thr	Thr	Glu	Val	Val	Gly	Asn	Val	Ile	Leu	Lys	Pro	Ser	Asp
2045						2050					2055			
Glu	Gly	Val	Lys	Val	Thr	Gln	Glu	Leu	Gly	His	Glu	Asp	Leu	Met
2060						2065					2070			
Ala	Ala	Tyr	Val	Glu	Asn	Thr	Ser	Ile	Thr	Ile	Lys	Lys	Pro	Asn
2075						2080					2085			
Glu	Leu	Ser	Leu	Ala	Leu	Gly	Leu	Lys	Thr	Ile	Ala	Thr	His	Gly
2090						2095					2100			
Ile	Ala	Ala	Ile	Asn	Ser	Val	Pro	Trp	Ser	Lys	Ile	Leu	Ala	Tyr
2105						2110					2115			
Val	Lys	Pro	Phe	Leu	Gly	Gln	Ala	Ala	Ile	Thr	Thr	Ser	Asn	Cys
2120						2125					2130			
Ala	Lys	Arg	Leu	Ala	Gln	Arg	Val	Phe	Asn	Asn	Tyr	Met	Pro	Tyr
2135						2140					2145			
Val	Phe	Thr	Leu	Leu	Phe	Gln	Leu	Cys	Thr	Phe	Thr	Lys	Ser	Thr
2150						2155					2160			
Asn	Ser	Arg	Ile	Arg	Ala	Ser	Leu	Pro	Thr	Thr	Ile	Ala	Lys	Asn
2165						2170					2175			
Ser	Val	Lys	Ser	Val	Ala	Lys	Leu	Cys	Leu	Asp	Ala	Gly	Ile	Asn
2180						2185					2190			
Tyr	Val	Lys	Ser	Pro	Lys	Phe	Ser	Lys	Leu	Phe	Thr	Ile	Ala	Met
2195						2200					2205			
Trp	Leu	Leu	Leu	Leu	Ser	Ile	Cys	Leu	Gly	Ser	Leu	Ile	Cys	Val
2210						2215					2220			
Thr	Ala	Ala	Phe	Gly	Val	Leu	Leu	Ser	Asn	Phe	Gly	Ala	Pro	Ser
2225						2230					2235			
Tyr	Cys	Asn	Gly	Val	Arg	Glu	Leu	Tyr	Leu	Asn	Ser	Ser	Asn	Val
2240						2245					2250			
Thr	Thr	Met	Asp	Phe	Cys	Glu	Gly	Ser	Phe	Pro	Cys	Ser	Ile	Cys
2255						2260					2265			
Leu	Ser	Gly	Leu	Asp	Ser	Leu	Asp	Ser	Tyr	Pro	Ala	Leu	Glu	Thr
2270						2275					2280			
Ile	Gln	Val	Thr	Ile	Ser	Ser	Tyr	Lys	Leu	Asp	Leu	Thr	Ile	Leu
2285						2290					2295			
Gly	Leu	Ala	Ala	Glu	Trp	Val	Leu	Ala	Tyr	Met	Leu	Phe	Thr	Lys
2300						2305					2310			
Phe	Phe	Tyr	Leu	Leu	Gly	Leu	Ser	Ala	Ile	Met	Gln	Val	Phe	Phe
2315						2320					2325			
Gly	Tyr	Phe	Ala	Ser	His	Phe	Ile	Ser	Asn	Ser	Trp	Leu	Met	Trp
2330						2335					2340			
Phe	Ile	Ile	Ser	Ile	Val	Gln	Met	Ala	Pro	Val	Ser	Ala	Met	Val
2345						2350					2355			
Arg	Met	Tyr	Ile	Phe	Phe	Ala	Ser	Phe	Tyr	Tyr	Ile	Trp	Lys	Ser
2360						2365					2370			
Tyr	Val	His	Ile	Met	Asp	Gly	Cys	Thr	Ser	Ser	Thr	Cys	Met	Met
2375						2380					2385			
Cys	Tyr	Lys	Arg	Asn	Arg	Ala	Thr	Arg	Val	Glu	Cys	Thr	Thr	Ile
2390						2395					2400			
Val	Asn	Gly	Met	Lys	Arg	Ser	Phe	Tyr	Val	Tyr	Ala	Asn	Gly	Gly
2405						2410					2415			
Arg	Gly	Phe	Cys	Lys	Thr	His	Asn	Trp	Asn	Cys	Leu	Asn	Cys	Asp
2420						2425					2430			
Thr	Phe	Cys	Thr	Gly	Ser	Thr	Phe	Ile	Ser	Asp	Glu	Val	Ala	Arg
2435						2440					2445			
Asp	Leu	Ser	Leu	Gln	Phe	Lys	Arg	Pro	Ile	Asn	Pro	Thr	Asp	Gln
2450						2455					2460			
Ser	Ser	Tyr	Ile	Val	Asp	Ser	Val	Ala	Val	Lys	Asn	Gly	Ala	Leu
2465						2470					2475			
His	Leu	Tyr	Phe	Asp	Lys	Ala	Gly	Gln	Lys	Thr	Tyr	Glu	Arg	His
2480						2485					2490			

Pro	Leu	Ser	His	Phe	Val	Asn	Leu	Asp	Asn	Leu	Arg	Ala	Asn	Asn
2495						2500					2505			
Thr	Lys	Gly	Ser	Leu	Pro	Ile	Asn	Val	Ile	Val	Phe	Asp	Gly	Lys
2510						2515					2520			
Ser	Lys	Cys	Asp	Glu	Ser	Ala	Ser	Lys	Ser	Ala	Ser	Val	Tyr	Tyr
2525						2530					2535			
Ser	Gln	Leu	Met	Cys	Gln	Pro	Ile	Leu	Leu	Leu	Asp	Gln	Ala	Leu
2540						2545					2550			
Val	Ser	Asp	Val	Gly	Asp	Ser	Thr	Glu	Val	Ser	Val	Lys	Met	Phe
2555						2560					2565			
Asp	Ala	Tyr	Val	Asp	Thr	Phe	Ser	Ala	Thr	Phe	Ser	Val	Pro	Met
2570						2575					2580			
Glu	Lys	Leu	Lys	Ala	Leu	Val	Ala	Thr	Ala	His	Ser	Glu	Leu	Ala
2585						2590					2595			
Lys	Gly	Val	Ala	Leu	Asp	Gly	Val	Leu	Ser	Thr	Phe	Val	Ser	Ala
2600						2605					2610			
Ala	Arg	Gln	Gly	Val	Val	Asp	Thr	Asp	Val	Asp	Thr	Lys	Asp	Val
2615						2620					2625			
Ile	Glu	Cys	Leu	Lys	Leu	Ser	His	His	Ser	Asp	Leu	Glu	Val	Thr
2630						2635					2640			
Gly	Asp	Ser	Cys	Asn	Asn	Phe	Met	Leu	Thr	Tyr	Asn	Lys	Val	Glu
2645						2650					2655			
Asn	Met	Thr	Pro	Arg	Asp	Leu	Gly	Ala	Cys	Ile	Asp	Cys	Asn	Ala
2660						2665					2670			
Arg	His	Ile	Asn	Ala	Gln	Val	Ala	Lys	Ser	His	Asn	Val	Ser	Leu
2675						2680					2685			
Ile	Trp	Asn	Val	Lys	Asp	Tyr	Met	Ser	Leu	Ser	Glu	Gln	Leu	Arg
2690						2695					2700			
Lys	Gln	Ile	Arg	Ser	Ala	Ala	Lys	Lys	Asn	Asn	Ile	Pro	Phe	Arg
2705						2710					2715			
Leu	Thr	Cys	Ala	Thr	Thr	Arg	Gln	Val	Val	Asn	Val	Ile	Thr	Thr
2720						2725					2730			
Lys	Ile	Ser	Leu	Lys	Gly	Gly	Lys	Ile	Val	Ser	Thr	Cys	Phe	Lys
2735						2740					2745			
Leu	Met	Leu	Lys	Ala	Thr	Leu	Leu	Cys	Val	Leu	Ala	Ala	Leu	Val
2750						2755					2760			
Cys	Tyr	Ile	Val	Met	Pro	Val	His	Thr	Leu	Ser	Ile	His	Asp	Gly
2765						2770					2775			
Tyr	Thr	Asn	Glu	Ile	Ile	Gly	Tyr	Lys	Ala	Ile	Gln	Asp	Gly	Val
2780						2785					2790			
Thr	Arg	Asp	Ile	Ile	Ser	Thr	Asp	Asp	Cys	Phe	Ala	Asn	Lys	His
2795						2800					2805			
Ala	Gly	Phe	Asp	Ala	Trp	Phe	Ser	Gln	Arg	Gly	Gly	Ser	Tyr	Lys
2810						2815					2820			
Asn	Asp	Lys	Ser	Cys	Pro	Val	Val	Ala	Ala	Ile	Ile	Thr	Arg	Glu
2825						2830					2835			
Ile	Gly	Phe	Ile	Val	Pro	Gly	Leu	Pro	Gly	Thr	Val	Leu	Arg	Ala
2840						2845					2850			
Ile	Asn	Gly	Asp	Phe	Leu	His	Phe	Leu	Pro	Arg	Val	Phe	Ser	Ala
2855						2860					2865			
Val	Gly	Asn	Ile	Cys	Tyr	Thr	Pro	Ser	Lys	Leu	Ile	Glu	Tyr	Ser
2870						2875					2880			
Asp	Phe	Ala	Thr	Ser	Ala	Cys	Val	Leu	Ala	Ala	Glu	Cys	Thr	Ile
2885						2890					2895			
Phe	Lys	Asp	Ala	Met	Gly	Lys	Pro	Val	Pro	Tyr	Cys	Tyr	Asp	Thr
2900						2905					2910			
Asn	Leu	Leu	Glu	Gly	Ser	Ile	Ser	Tyr	Ser	Glu	Leu	Arg	Pro	Asp
2915						2920					2925			
Thr	Arg	Tyr	Val	Leu	Met	Asp	Gly	Ser	Ile	Ile	Gln	Phe	Pro	Asn
2930						2935					2940			
Thr	Tyr	Leu	Glu	Gly	Ser	Val	Arg	Val	Val	Thr	Thr	Phe	Asp	Ala
2945						2950					2955			

Glu	Tyr	Cys	Arg	His	Gly	Thr	Cys	Glu	Arg	Ser	Glu	Val	Gly	Ile
2960					2965						2970			
Cys	Leu	Ser	Thr	Ser	Gly	Arg	Trp	Val	Leu	Asn	Asn	Glu	His	Tyr
2975					2980						2985			
Arg	Ala	Leu	Ser	Gly	Val	Phe	Cys	Gly	Val	Asp	Ala	Met	Asn	Leu
2990					2995						3000			
Ile	Ala	Asn	Ile	Phe	Thr	Pro	Leu	Val	Gln	Pro	Val	Gly	Ala	Leu
3005					3010						3015			
Asp	Val	Ser	Ala	Ser	Val	Val	Ala	Gly	Gly	Ile	Ile	Ala	Ile	Leu
3020					3025						3030			
Val	Thr	Cys	Ala	Ala	Tyr	Tyr	Phe	Met	Lys	Phe	Arg	Arg	Val	Phe
3035					3040						3045			
Gly	Glu	Tyr	Asn	His	Val	Val	Ala	Ala	Asn	Ala	Leu	Leu	Phe	Leu
3050					3055						3060			
Met	Ser	Phe	Thr	Ile	Leu	Cys	Leu	Val	Pro	Ala	Tyr	Ser	Phe	Leu
3065					3070						3075			
Pro	Gly	Val	Tyr	Ser	Val	Phe	Tyr	Leu	Tyr	Leu	Thr	Phe	Tyr	Phe
3080					3085						3090			
Thr	Asn	Asp	Val	Ser	Phe	Leu	Ala	His	Leu	Gln	Trp	Phe	Ala	Met
3095					3100						3105			
Phe	Ser	Pro	Ile	Val	Pro	Phe	Trp	Ile	Thr	Ala	Ile	Tyr	Val	Phe
3110					3115						3120			
Cys	Ile	Ser	Leu	Lys	His	Cys	His	Trp	Phe	Phe	Asn	Asn	Tyr	Leu
3125					3130						3135			
Arg	Lys	Arg	Val	Met	Phe	Asn	Gly	Val	Thr	Phe	Ser	Thr	Phe	Glu
3140					3145						3150			
Glu	Ala	Ala	Leu	Cys	Thr	Phe	Leu	Leu	Asn	Lys	Glu	Met	Tyr	Leu
3155					3160						3165			
Lys	Leu	Arg	Ser	Glu	Thr	Leu	Leu	Pro	Leu	Thr	Gln	Tyr	Asn	Arg
3170					3175						3180			
Tyr	Leu	Ala	Leu	Tyr	Asn	Lys	Tyr	Lys	Tyr	Phe	Ser	Gly	Ala	Leu
3185					3190						3195			
Asp	Thr	Thr	Ser	Tyr	Arg	Glu	Ala	Ala	Cys	Cys	His	Leu	Ala	Lys
3200					3205						3210			
Ala	Leu	Asn	Asp	Phe	Ser	Asn	Ser	Gly	Ala	Asp	Val	Leu	Tyr	Gln
3215					3220						3225			
Pro	Pro	Gln	Thr	Ser	Ile	Thr	Ser	Ala	Val	Leu	Gln	Ser	Gly	Phe
3230					3235						3240			
Arg	Lys	Met	Ala	Phe	Pro	Ser	Gly	Lys	Val	Glu	Gly	Cys	Met	Val
3245					3250						3255			
Gln	Val	Thr	Cys	Gly	Thr	Thr	Thr	Leu	Asn	Gly	Leu	Trp	Leu	Asp
3260					3265						3270			
Asp	Thr	Val	Tyr	Cys	Pro	Arg	His	Val	Ile	Cys	Thr	Ala	Glu	Asp
3275					3280						3285			
Met	Leu	Asn	Pro	Asn	Tyr	Glu	Asp	Leu	Leu	Ile	Arg	Lys	Ser	Asn
3290					3295						3300			
His	Ser	Phe	Leu	Val	Gln	Ala	Gly	Asn	Val	Gln	Leu	Arg	Val	Ile
3305					3310						3315			
Gly	His	Ser	Met	Gln	Asn	Cys	Leu	Leu	Arg	Leu	Lys	Val	Asp	Thr
3320					3325						3330			
Ser	Asn	Pro	Lys	Thr	Pro	Lys	Tyr	Lys	Phe	Val	Arg	Ile	Gln	Pro
3335					3340						3345			
Gly	Gln	Thr	Phe	Ser	Val	Leu	Ala	Cys	Tyr	Asn	Gly	Ser	Pro	Ser
3350					3355						3360			
Gly	Val	Tyr	Gln	Cys	Ala	Met	Arg	Pro	Asn	His	Thr	Ile	Lys	Gly
3365					3370						3375			
Ser	Phe	Leu	Asn	Gly	Ser	Cys	Gly	Ser	Val	Gly	Phe	Asn	Ile	Asp
3380					3385						3390			
Tyr	Asp	Cys	Val	Ser	Phe	Cys	Tyr	Met	His	His	Met	Glu	Leu	Pro
3395					3400						3405			
Thr	Gly	Val	His	Ala	Gly	Thr	Asp	Leu	Glu	Gly	Lys	Phe	Tyr	Gly
3410					3415						3420			

Pro	Phe	Val	Asp	Arg	Gln	Thr	Ala	Gln	Ala	Ala	Gly	Thr	Asp	Thr
3425							3430				3435			
Thr	Ile	Thr	Leu	Asn	Val	Leu	Ala	Trp	Leu	Tyr	Ala	Ala	Val	Ile
3440							3445				3450			
Asn	Gly	Asp	Arg	Trp	Phe	Leu	Asn	Arg	Phe	Thr	Thr	Thr	Leu	Asn
3455							3460				3465			
Asp	Phe	Asn	Leu	Val	Ala	Met	Lys	Tyr	Asn	Tyr	Glu	Pro	Leu	Thr
3470							3475				3480			
Gln	Asp	His	Val	Asp	Ile	Leu	Gly	Pro	Leu	Ser	Ala	Gln	Thr	Gly
3485							3490				3495			
Ile	Ala	Val	Leu	Asp	Met	Cys	Ala	Ala	Leu	Lys	Glu	Leu	Leu	Gln
3500							3505				3510			
Asn	Gly	Met	Asn	Gly	Arg	Thr	Ile	Leu	Gly	Ser	Thr	Ile	Leu	Glu
3515							3520				3525			
Asp	Glu	Phe	Thr	Pro	Phe	Asp	Val	Val	Arg	Gln	Cys	Ser	Gly	Val
3530							3535				3540			
Thr	Phe	Gln	Gly	Lys	Phe	Lys	Lys	Ile	Val	Lys	Gly	Thr	His	His
3545							3550				3555			
Trp	Met	Leu	Leu	Thr	Phe	Leu	Thr	Ser	Leu	Leu	Ile	Leu	Val	Gln
3560							3565				3570			
Ser	Thr	Gln	Trp	Ser	Leu	Phe	Phe	Phe	Val	Tyr	Glu	Asn	Ala	Phe
3575							3580				3585			
Leu	Pro	Phe	Thr	Leu	Gly	Ile	Met	Ala	Ile	Ala	Ala	Cys	Ala	Met
3590							3595				3600			
Leu	Leu	Val	Lys	His	Lys	His	Ala	Phe	Leu	Cys	Leu	Phe	Leu	Leu
3605							3610				3615			
Pro	Ser	Leu	Ala	Thr	Val	Ala	Tyr	Phe	Asn	Met	Val	Tyr	Met	Pro
3620							3625				3630			
Ala	Ser	Trp	Val	Met	Arg	Ile	Met	Thr	Trp	Leu	Glu	Leu	Ala	Asp
3635							3640				3645			
Thr	Ser	Leu	Ser	Gly	Tyr	Arg	Leu	Lys	Asp	Cys	Val	Met	Tyr	Ala
3650							3655				3660			
Ser	Ala	Leu	Val	Leu	Leu	Ile	Leu	Met	Thr	Ala	Arg	Thr	Val	Tyr
3665							3670				3675			
Asp	Asp	Ala	Ala	Arg	Arg	Val	Trp	Thr	Leu	Met	Asn	Val	Ile	Thr
3680							3685				3690			
Leu	Val	Tyr	Lys	Val	Tyr	Tyr	Gly	Asn	Ala	Leu	Asp	Gln	Ala	Ile
3695							3700				3705			
Ser	Met	Trp	Ala	Leu	Val	Ile	Ser	Val	Thr	Ser	Asn	Tyr	Ser	Gly
3710							3715				3720			
Val	Val	Thr	Thr	Ile	Met	Phe	Leu	Ala	Arg	Ala	Ile	Val	Phe	Val
3725							3730				3735			
Cys	Val	Glu	Tyr	Tyr	Pro	Leu	Leu	Phe	Ile	Thr	Gly	Asn	Thr	Leu
3740							3745				3750			
Gln	Cys	Ile	Met	Leu	Val	Tyr	Cys	Phe	Leu	Gly	Tyr	Cys	Cys	Cys
3755							3760				3765			
Cys	Tyr	Phe	Gly	Leu	Phe	Cys	Leu	Leu	Asn	Arg	Tyr	Phe	Arg	Leu
3770							3775				3780			
Thr	Leu	Gly	Val	Tyr	Asp	Tyr	Leu	Val	Ser	Thr	Gln	Glu	Phe	Arg
3785							3790				3795			
Tyr	Met	Asn	Ser	Gln	Gly	Leu	Leu	Pro	Pro	Lys	Ser	Ser	Ile	Asp
3800							3805				3810			
Ala	Phe	Lys	Leu	Asn	Ile	Lys	Leu	Leu	Gly	Ile	Gly	Gly	Lys	Pro
3815							3820				3825			
Cys	Ile	Lys	Val	Ala	Thr	Val	Gln	Ser	Lys	Met	Ser	Asp	Val	Lys
3830							3835				3840			
Cys	Thr	Ser	Val	Val	Leu	Leu	Ser	Val	Leu	Gln	Gln	Leu	Arg	Val
3845							3850				3855			
Glu	Ser	Ser	Ser	Lys	Leu	Trp	Ala	Gln	Cys	Val	Gln	Leu	His	Asn
3860							3865				3870			
Asp	Ile	Leu	Leu	Ala	Lys	Asp	Thr	Thr	Glu	Ala	Phe	Glu	Lys	Met
3875							3880				3885			

Val	Ser	Leu	Leu	Ser	Val	Leu	Leu	Ser	Met	Gln	Gly	Ala	Val	Asp
3890						3895					3900			
Ile	Asn	Arg	Leu	Cys	Glu	Glu	Met	Leu	Asp	Asn	Arg	Ala	Thr	Leu
3905						3910					3915			
Gln	Ala	Ile	Ala	Ser	Glu	Phe	Ser	Ser	Leu	Pro	Ser	Tyr	Ala	Ala
3920						3925					3930			
Tyr	Ala	Thr	Ala	Gln	Glu	Ala	Tyr	Glu	Gln	Ala	Val	Ala	Asn	Gly
3935						3940					3945			
Asp	Ser	Glu	Val	Val	Leu	Lys	Lys	Leu	Lys	Lys	Ser	Leu	Asn	Val
3950						3955					3960			
Ala	Lys	Ser	Glu	Phe	Asp	Arg	Asp	Ala	Ala	Met	Gln	Arg	Lys	Leu
3965						3970					3975			
Glu	Lys	Met	Ala	Asp	Gln	Ala	Met	Thr	Gln	Met	Tyr	Lys	Gln	Ala
3980						3985					3990			
Arg	Ser	Glu	Asp	Lys	Arg	Ala	Lys	Val	Thr	Ser	Ala	Met	Gln	Thr
3995						4000					4005			
Met	Leu	Phe	Thr	Met	Leu	Arg	Lys	Leu	Asp	Asn	Asp	Ala	Leu	Asn
4010						4015					4020			
Asn	Ile	Ile	Asn	Asn	Ala	Arg	Asp	Gly	Cys	Val	Pro	Leu	Asn	Ile
4025						4030					4035			
Ile	Pro	Leu	Thr	Thr	Ala	Ala	Lys	Leu	Met	Val	Val	Val	Pro	Asp
4040						4045					4050			
Tyr	Gly	Thr	Tyr	Lys	Asn	Thr	Cys	Asp	Gly	Asn	Thr	Phe	Thr	Tyr
4055						4060					4065			
Ala	Ser	Ala	Leu	Trp	Glu	Ile	Gln	Gln	Val	Val	Asp	Ala	Asp	Ser
4070						4075					4080			
Lys	Ile	Val	Gln	Leu	Ser	Glu	Ile	Asn	Met	Asp	Asn	Ser	Pro	Asn
4085						4090					4095			
Leu	Ala	Trp	Pro	Leu	Ile	Val	Thr	Ala	Leu	Arg	Ala	Asn	Ser	Ala
4100						4105					4110			
Val	Lys	Leu	Gln	Asn	Asn	Glu	Leu	Ser	Pro	Val	Ala	Leu	Arg	Gln
4115						4120					4125			
Met	Ser	Cys	Ala	Ala	Gly	Thr	Thr	Gln	Thr	Ala	Cys	Thr	Asp	Asp
4130						4135					4140			
Asn	Ala	Leu	Ala	Tyr	Tyr	Asn	Asn	Ser	Lys	Gly	Gly	Arg	Phe	Val
4145						4150					4155			
Leu	Ala	Leu	Leu	Ser	Asp	His	Gln	Asp	Leu	Lys	Trp	Ala	Arg	Phe
4160						4165					4170			
Pro	Lys	Ser	Asp	Gly	Thr	Gly	Thr	Ile	Tyr	Thr	Glu	Leu	Glu	Pro
4175						4180					4185			
Pro	Cys	Arg	Phe	Val	Thr	Asp	Thr	Pro	Lys	Gly	Pro	Lys	Val	Lys
4190						4195					4200			
Tyr	Leu	Tyr	Phe	Ile	Lys	Gly	Leu	Asn	Asn	Leu	Asn	Arg	Gly	Met
4205						4210					4215			
Val	Leu	Gly	Ser	Leu	Ala	Ala	Thr	Val	Arg	Leu	Gln	Ala	Gly	Asn
4220						4225					4230			
Ala	Thr	Glu	Val	Pro	Ala	Asn	Ser	Thr	Val	Leu	Ser	Phe	Cys	Ala
4235						4240					4245			
Phe	Ala	Val	Asp	Pro	Ala	Lys	Ala	Tyr	Lys	Asp	Tyr	Leu	Ala	Ser
4250						4255					4260			
Gly	Gly	Gln	Pro	Ile	Thr	Asn	Cys	Val	Lys	Met	Leu	Cys	Thr	His
4265						4270					4275			
Thr	Gly	Thr	Gly	Gln	Ala	Ile	Thr	Val	Thr	Pro	Glu	Ala	Asn	Met
4280						4285					4290			
Asp	Gln	Glu	Ser	Phe	Gly	Gly	Ala	Ser	Cys	Cys	Leu	Tyr	Cys	Arg
4295						4300					4305			
Cys	His	Ile	Asp	His	Pro	Asn	Pro	Lys	Gly	Phe	Cys	Asp	Leu	Lys
4310						4315					4320			
Gly	Lys	Tyr	Val	Gln	Ile	Pro	Thr	Thr	Cys	Ala	Asn	Asp	Pro	Val
4325						4330					4335			
Gly	Phe	Thr	Leu	Arg	Asn	Thr	Val	Cys	Thr	Val	Cys	Gly	Met	Trp
4340						4345					4350			

Lys	Gly	Tyr	Gly	Cys	Ser	Cys	Asp	Gln	Leu	Arg	Glu	Pro	Leu	Met
4355					4360					4365				
Gln	Ser	Ala	Asp	Ala	Ser	Thr	Phe	Leu	Asn	Gly	Phe	Ala	Val	
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<210> 75

<211> 2695

<212> PRT

<213> CORONAVIRUS

<400> 75

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Thr	Ser	Thr	Asp	Val	Val	Tyr	Arg	Ala	Phe	Asp	Ile	Tyr	Asn	Glu	Lys
						20			25				30		
Val	Ala	Gly	Phe	Ala	Lys	Phe	Leu	Lys	Thr	Asn	Cys	Cys	Arg	Phe	Gln
						35			40			45			
Glu	Lys	Asp	Glu	Glu	Gly	Asn	Leu	Leu	Asp	Ser	Tyr	Phe	Val	Val	Lys
						50			55			60			
Arg	His	Thr	Met	Ser	Asn	Tyr	Gln	His	Glu	Glu	Thr	Ile	Tyr	Asn	Leu
65						70			75				80		
Val	Lys	Asp	Cys	Pro	Ala	Val	Ala	Val	His	Asp	Phe	Phe	Lys	Phe	Arg
						85			90			95			
Val	Asp	Gly	Asp	Met	Val	Pro	His	Ile	Ser	Arg	Gln	Arg	Leu	Thr	Lys
						100			105			110			
Tyr	Thr	Met	Ala	Asp	Leu	Val	Tyr	Ala	Leu	Arg	His	Phe	Asp	Glu	Gly
						115			120			125			
Asn	Cys	Asp	Thr	Leu	Lys	Glu	Ile	Leu	Val	Thr	Tyr	Asn	Cys	Cys	Asp
						130			135			140			
Asp	Asp	Tyr	Phe	Asn	Lys	Lys	Asp	Trp	Tyr	Asp	Phe	Val	Glu	Asn	Pro
145						150					155			160	
Asp	Ile	Leu	Arg	Val	Tyr	Ala	Asn	Leu	Gly	Glu	Arg	Val	Arg	Gln	Ser
						165			170			175			
Leu	Leu	Lys	Thr	Val	Gln	Phe	Cys	Asp	Ala	Met	Arg	Asp	Ala	Gly	Ile
						180			185			190			
Val	Gly	Val	Leu	Thr	Leu	Asp	Asn	Gln	Asp	Leu	Asn	Gly	Asn	Trp	Tyr
						195			200			205			
Asp	Phe	Gly	Asp	Phe	Val	Gln	Val	Ala	Pro	Gly	Cys	Gly	Val	Pro	Ile
210						215					220				
Val	Asp	Ser	Tyr	Tyr	Ser	Leu	Leu	Met	Pro	Ile	Leu	Thr	Leu	Thr	Arg
225						230					235			240	
Ala	Leu	Ala	Ala	Glu	Ser	His	Met	Asp	Ala	Asp	Leu	Ala	Lys	Pro	Leu
						245					250			255	
Ile	Lys	Trp	Asp	Leu	Leu	Lys	Tyr	Asp	Phe	Thr	Glu	Glu	Arg	Leu	Cys
						260			265			270			
Leu	Phe	Asp	Arg	Tyr	Phe	Lys	Tyr	Trp	Asp	Gln	Thr	Tyr	His	Pro	Asn
						275			280			285			
Cys	Ile	Asn	Cys	Leu	Asp	Asp	Arg	Cys	Ile	Leu	His	Cys	Ala	Asn	Phe
290						295					300				
Asn	Val	Leu	Phe	Ser	Thr	Val	Phe	Pro	Pro	Thr	Ser	Phe	Gly	Pro	Leu
305						310					315			320	
Val	Arg	Lys	Ile	Phe	Val	Asp	Gly	Val	Pro	Phe	Val	Val	Ser	Thr	Gly
						325					330			335	
Tyr	His	Phe	Arg	Glu	Leu	Gly	Val	Val	His	Asn	Gln	Asp	Val	Asn	Leu
						340					345			350	
His	Ser	Ser	Arg	Leu	Ser	Phe	Lys	Glu	Leu	Leu	Val	Tyr	Ala	Ala	Asp
						355			360			365			
Pro	Ala	Met	His	Ala	Ala	Ser	Gly	Asn	Leu	Leu	Asp	Lys	Arg	Thr	
370						375					380			380	
Thr	Cys	Phe	Ser	Val	Ala	Ala	Leu	Thr	Asn	Val	Ala	Phe	Gln	Thr	
385						390					395			400	
Val	Lys	Pro	Gly	Asn	Phe	Asn	Lys	Asp	Phe	Tyr	Asp	Phe	Ala	Val	Ser

405	410	415
Lys Gly Phe Phe Lys Glu Gly Ser Ser Val Glu Leu Lys His Phe Phe		
420	425	430
Phe Ala Gln Asp Gly Asn Ala Ala Ile Ser Asp Tyr Asp Tyr Tyr Arg		
435	440	445
Tyr Asn Leu Pro Thr Met Cys Asp Ile Arg Gln Leu Leu Phe Val Val		
450	455	460
Glu Val Val Asp Lys Tyr Phe Asp Cys Tyr Asp Gly Gly Cys Ile Asn		
465	470	475
Ala Asn Gln Val Ile Val Asn Asn Leu Asp Lys Ser Ala Gly Phe Pro		
485	490	495
Phe Asn Lys Trp Gly Lys Ala Arg Leu Tyr Tyr Asp Ser Met Ser Tyr		
500	505	510
Glu Asp Gln Asp Ala Leu Phe Ala Tyr Thr Lys Arg Asn Val Ile Pro		
515	520	525
Thr Ile Thr Gln Met Asn Leu Lys Tyr Ala Ile Ser Ala Lys Asn Arg		
530	535	540
Ala Arg Thr Val Ala Gly Val Ser Ile Cys Ser Thr Met Thr Asn Arg		
545	550	555
Gln Phe His Gln Lys Leu Leu Lys Ser Ile Ala Ala Thr Arg Gly Ala		
565	570	575
Thr Val Val Ile Gly Thr Ser Lys Phe Tyr Gly Gly Trp His Asn Met		
580	585	590
Leu Lys Thr Val Tyr Ser Asp Val Glu Thr Pro His Leu Met Gly Trp		
595	600	605
Asp Tyr Pro Lys Cys Asp Arg Ala Met Pro Asn Met Leu Arg Ile Met		
610	615	620
Ala Ser Leu Val Leu Ala Arg Lys His Asn Thr Cys Cys Asn Leu Ser		
625	630	635
His Arg Phe Tyr Arg Leu Ala Asn Glu Cys Ala Gln Val Leu Ser Glu		
645	650	655
Met Val Met Cys Gly Gly Ser Leu Tyr Val Lys Pro Gly Gly Thr Ser		
660	665	670
Ser Gly Asp Ala Thr Thr Ala Tyr Ala Asn Ser Val Phe Asn Ile Cys		
675	680	685
Gln Ala Val Thr Ala Asn Val Asn Ala Leu Leu Ser Thr Asp Gly Asn		
690	695	700
Lys Ile Ala Asp Lys Tyr Val Arg Asn Leu Gln His Arg Leu Tyr Glu		
705	710	715
Cys Leu Tyr Arg Asn Arg Asp Val Asp His Glu Phe Val Asp Glu Phe		
725	730	735
Tyr Ala Tyr Leu Arg Lys His Phe Ser Met Met Ile Leu Ser Asp Asp		
740	745	750
Ala Val Val Cys Tyr Asn Ser Asn Tyr Ala Ala Gln Gly Leu Val Ala		
755	760	765
Ser Ile Lys Asn Phe Lys Ala Val Leu Tyr Tyr Gln Asn Asn Val Phe		
770	775	780
Met Ser Glu Ala Lys Cys Trp Thr Glu Thr Asp Leu Thr Lys Gly Pro		
785	790	795
His Glu Phe Cys Ser Gln His Thr Met Leu Val Lys Gln Gly Asp Asp		
805	810	815
Tyr Val Tyr Leu Pro Tyr Pro Asp Pro Ser Arg Ile Leu Gly Ala Gly		
820	825	830
Cys Phe Val Asp Asp Ile Val Lys Thr Asp Gly Thr Leu Met Ile Glu		
835	840	845
Arg Phe Val Ser Leu Ala Ile Asp Ala Tyr Pro Leu Thr Lys His Pro		
850	855	860
Asn Gln Glu Tyr Ala Asp Val Phe His Leu Tyr Leu Gln Tyr Ile Arg		
865	870	875
Lys Leu His Asp Glu Leu Thr Gly His Met Leu Asp Met Tyr Ser Val		
885	890	895

Met Leu Thr Asn Asp Asn Thr Ser Arg Tyr Trp Glu Pro Glu Phe Tyr
 900 905 910
 Glu Ala Met Tyr Thr Pro His Thr Val Leu Gln Ala Val Gly Ala Cys
 915 920 925
 Val Leu Cys Asn Ser Gln Thr Ser Leu Arg Cys Gly Ala Cys Ile Arg
 930 935 940
 Arg Pro Phe Leu Cys Cys Lys Cys Cys Tyr Asp His Val Ile Ser Thr
 945 950 955 960
 Ser His Lys Leu Val Leu Ser Val Asn Pro Tyr Val Cys Asn Ala Pro
 965 970 975
 Gly Cys Asp Val Thr Asp Val Thr Gln Leu Tyr Leu Gly Gly Met Ser
 980 985 990
 Tyr Tyr Cys Lys Ser His Lys Pro Pro Ile Ser Phe Pro Leu Cys Ala
 995 1000 1005
 Asn Gly Gln Val Phe Gly Leu Tyr Lys Asn Thr Cys Val Gly Ser
 1010 1015 1020
 Asp Asn Val Thr Asp Phe Asn Ala Ile Ala Thr Cys Asp Trp Thr
 1025 1030 1035
 Asn Ala Gly Asp Tyr Ile Leu Ala Asn Thr Cys Thr Glu Arg Leu
 1040 1045 1050
 Lys Leu Phe Ala Ala Glu Thr Leu Lys Ala Thr Glu Glu Thr Phe
 1055 1060 1065
 Lys Leu Ser Tyr Gly Ile Ala Thr Val Arg Glu Val Leu Ser Asp
 1070 1075 1080
 Arg Glu Leu His Leu Ser Trp Glu Val Gly Lys Pro Arg Pro Pro
 1085 1090 1095
 Leu Asn Arg Asn Tyr Val Phe Thr Gly Tyr Arg Val Thr Lys Asn
 1100 1105 1110
 Ser Lys Val Gln Ile Gly Glu Tyr Thr Phe Glu Lys Gly Asp Tyr
 1115 1120 1125
 Gly Asp Ala Val Val Tyr Arg Gly Thr Thr Thr Tyr Lys Leu Asn
 1130 1135 1140
 Val Gly Asp Tyr Phe Val Leu Thr Ser His Thr Val Met Pro Leu
 1145 1150 1155
 Ser Ala Pro Thr Leu Val Pro Gln Glu His Tyr Val Arg Ile Thr
 1160 1165 1170
 Gly Leu Tyr Pro Thr Leu Asn Ile Ser Asp Glu Phe Ser Ser Asn
 1175 1180 1185
 Val Ala Asn Tyr Gln Lys Val Gly Met Gln Lys Tyr Ser Thr Leu
 1190 1195 1200
 Gln Gly Pro Pro Gly Thr Gly Lys Ser His Phe Ala Ile Gly Leu
 1205 1210 1215
 Ala Leu Tyr Tyr Pro Ser Ala Arg Ile Val Tyr Thr Ala Cys Ser
 1220 1225 1230
 His Ala Ala Val Asp Ala Leu Cys Glu Lys Ala Leu Lys Tyr Leu
 1235 1240 1245
 Pro Ile Asp Lys Cys Ser Arg Ile Ile Pro Ala Arg Ala Arg Val
 1250 1255 1260
 Glu Cys Phe Asp Lys Phe Lys Val Asn Ser Thr Leu Glu Gln Tyr
 1265 1270 1275
 Val Phe Cys Thr Val Asn Ala Leu Pro Glu Thr Thr Ala Asp Ile
 1280 1285 1290
 Val Val Phe Asp Glu Ile Ser Met Ala Thr Asn Tyr Asp Leu Ser
 1295 1300 1305
 Val Val Asn Ala Arg Leu Arg Ala Lys His Tyr Val Tyr Ile Gly
 1310 1315 1320
 Asp Pro Ala Gln Leu Pro Ala Pro Arg Thr Leu Leu Thr Lys Gly
 1325 1330 1335
 Thr Leu Glu Pro Glu Tyr Phe Asn Ser Val Cys Arg Leu Met Lys
 1340 1345 1350
 Thr Ile Gly Pro Asp Met Phe Leu Gly Thr Cys Arg Arg Cys Pro
 1355 1360 1365

Ala	Glu	Ile	Val	Asp	Thr	Val	Ser	Ala	Leu	Val	Tyr	Asp	Asn	Lys
1370						1375					1380			
Leu	Lys	Ala	His	Lys	Asp	Lys	Ser	Ala	Gln	Cys	Phe	Lys	Met	Phe
1385						1390					1395			
Tyr	Lys	Gly	Val	Ile	Thr	His	Asp	Val	Ser	Ser	Ala	Ile	Asn	Arg
1400						1405					1410			
Pro	Gln	Ile	Gly	Val	Val	Arg	Glu	Phe	Leu	Thr	Arg	Asn	Pro	Ala
1415						1420					1425			
Trp	Arg	Lys	Ala	Val	Phe	Ile	Ser	Pro	Tyr	Asn	Ser	Gln	Asn	Ala
1430						1435					1440			
Val	Ala	Ser	Lys	Ile	Leu	Gly	Leu	Pro	Thr	Gln	Thr	Val	Asp	Ser
1445						1450					1455			
Ser	Gln	Gly	Ser	Glu	Tyr	Asp	Tyr	Val	Ile	Phe	Thr	Gln	Thr	Thr
1460						1465					1470			
Glu	Thr	Ala	His	Ser	Cys	Asn	Val	Asn	Arg	Phe	Asn	Val	Ala	Ile
1475						1480					1485			
Thr	Arg	Ala	Lys	Ile	Gly	Ile	Leu	Cys	Ile	Met	Ser	Asp	Arg	Asp
1490						1495					1500			
Leu	Tyr	Asp	Lys	Leu	Gln	Phe	Thr	Ser	Leu	Glu	Ile	Pro	Arg	Arg
1505						1510					1515			
Asn	Val	Ala	Thr	Leu	Gln	Ala	Glu	Asn	Val	Thr	Gly	Leu	Phe	Lys
1520						1525					1530			
Asp	Cys	Ser	Lys	Ile	Ile	Thr	Gly	Leu	His	Pro	Thr	Gln	Ala	Pro
1535						1540					1545			
Thr	His	Leu	Ser	Val	Asp	Ile	Lys	Phe	Lys	Thr	Glu	Gly	Leu	Cys
1550						1555					1560			
Val	Asp	Ile	Pro	Gly	Ile	Pro	Lys	Asp	Met	Thr	Tyr	Arg	Arg	Leu
1565						1570					1575			
Ile	Ser	Met	Met	Gly	Phe	Lys	Met	Asn	Tyr	Gln	Val	Asn	Gly	Tyr
1580						1585					1590			
Pro	Asn	Met	Phe	Ile	Thr	Arg	Glu	Glu	Ala	Ile	Arg	His	Val	Arg
1595						1600					1605			
Ala	Trp	Ile	Gly	Phe	Asp	Val	Glu	Gly	Cys	His	Ala	Thr	Arg	Asp
1610						1615					1620			
Ala	Val	Gly	Thr	Asn	Leu	Pro	Leu	Gln	Leu	Gly	Phe	Ser	Thr	Gly
1625						1630					1635			
Val	Asn	Leu	Val	Ala	Val	Pro	Thr	Gly	Tyr	Val	Asp	Thr	Glu	Asn
1640						1645					1650			
Asn	Thr	Glu	Phe	Thr	Arg	Val	Asn	Ala	Lys	Pro	Pro	Pro	Gly	Asp
1655						1660					1665			
Gln	Phe	Lys	His	Leu	Ile	Pro	Leu	Met	Tyr	Lys	Gly	Leu	Pro	Trp
1670						1675					1680			
Asn	Val	Val	Arg	Ile	Lys	Ile	Val	Gln	Met	Leu	Ser	Asp	Thr	Leu
1685						1690					1695			
Lys	Gly	Leu	Ser	Asp	Arg	Val	Val	Phe	Val	Leu	Trp	Ala	His	Gly
1700						1705					1710			
Phe	Glu	Leu	Thr	Ser	Met	Lys	Tyr	Phe	Val	Lys	Ile	Gly	Pro	Glu
1715						1720					1725			
Arg	Thr	Cys	Cys	Leu	Cys	Asp	Lys	Arg	Ala	Thr	Cys	Phe	Ser	Thr
1730						1735					1740			
Ser	Ser	Asp	Thr	Tyr	Ala	Cys	Trp	Asn	His	Ser	Val	Gly	Phe	Asp
1745						1750					1755			
Tyr	Val	Tyr	Asn	Pro	Phe	Met	Ile	Asp	Val	Gln	Gln	Trp	Gly	Phe
1760						1765					1770			
Thr	Gly	Asn	Leu	Gln	Ser	Asn	His	Asp	Gln	His	Cys	Gln	Val	His
1775						1780					1785			
Gly	Asn	Ala	His	Val	Ala	Ser	Cys	Asp	Ala	Ile	Met	Thr	Arg	Cys
1790						1795					1800			
Leu	Ala	Val	His	Glu	Cys	Phe	Val	Lys	Arg	Val	Asp	Trp	Ser	Val
1805						1810					1815			
Glu	Tyr	Pro	Ile	Ile	Gly	Asp	Glu	Leu	Arg	Val	Asn	Ser	Ala	Cys
1820						1825					1830			

Arg	Lys	Val	Gln	His	Met	Val	Val	Lys	Ser	Ala	Leu	Leu	Ala	Asp
1835						1840					1845			
Lys	Phe	Pro	Val	Leu	His	Asp	Ile	Gly	Asn	Pro	Lys	Ala	Ile	Lys
1850						1855					1860			
Cys	Val	Pro	Gln	Ala	Glu	Val	Glu	Trp	Lys	Phe	Tyr	Asp	Ala	Gln
1865						1870					1875			
Pro	Cys	Ser	Asp	Lys	Ala	Tyr	Lys	Ile	Glu	Glu	Leu	Phe	Tyr	Ser
1880						1885					1890			
Tyr	Ala	Thr	His	His	Asp	Lys	Phe	Thr	Asp	Gly	Val	Cys	Leu	Phe
1895						1900					1905			
Trp	Asn	Cys	Asn	Val	Asp	Arg	Tyr	Pro	Ala	Asn	Ala	Ile	Val	Cys
1910						1915					1920			
Arg	Phe	Asp	Thr	Arg	Val	Leu	Ser	Asn	Leu	Asn	Leu	Pro	Gly	Cys
1925						1930					1935			
Asp	Gly	Gly	Ser	Leu	Tyr	Val	Asn	Lys	His	Ala	Phe	His	Thr	Pro
1940						1945					1950			
Ala	Phe	Asp	Lys	Ser	Ala	Phe	Thr	Asn	Leu	Lys	Gln	Leu	Pro	Phe
1955						1960					1965			
Phe	Tyr	Tyr	Ser	Asp	Ser	Pro	Cys	Glu	Ser	His	Gly	Lys	Gln	Val
1970						1975					1980			
Val	Ser	Asp	Ile	Asp	Tyr	Val	Pro	Leu	Lys	Ser	Ala	Thr	Cys	Ile
1985						1990					1995			
Thr	Arg	Cys	Asn	Leu	Gly	Gly	Ala	Val	Cys	Arg	His	His	Ala	Asn
2000						2005					2010			
Glu	Tyr	Arg	Gln	Tyr	Leu	Asp	Ala	Tyr	Asn	Met	Met	Ile	Ser	Ala
2015						2020					2025			
Gly	Phe	Ser	Leu	Trp	Ile	Tyr	Lys	Gln	Phe	Asp	Thr	Tyr	Asn	Leu
2030						2035					2040			
Trp	Asn	Thr	Phe	Thr	Arg	Leu	Gln	Ser	Leu	Glu	Asn	Val	Ala	Tyr
2045						2050					2055			
Asn	Val	Val	Asn	Lys	Gly	His	Phe	Asp	Gly	His	Ala	Gly	Glu	Ala
2060						2065					2070			
Pro	Val	Ser	Ile	Ile	Asn	Asn	Ala	Val	Tyr	Thr	Lys	Val	Asp	Gly
2075						2080					2085			
Ile	Asp	Val	Glu	Ile	Phe	Glu	Asn	Lys	Thr	Thr	Leu	Pro	Val	Asn
2090						2095					2100			
Val	Ala	Phe	Glu	Leu	Trp	Ala	Lys	Arg	Asn	Ile	Lys	Pro	Val	Pro
2105						2110					2115			
Glu	Ile	Lys	Ile	Leu	Asn	Asn	Leu	Gly	Val	Asp	Ile	Ala	Ala	Asn
2120						2125					2130			
Thr	Val	Ile	Trp	Asp	Tyr	Lys	Arg	Glu	Ala	Pro	Ala	His	Val	Ser
2135						2140					2145			
Thr	Ile	Gly	Val	Cys	Thr	Met	Thr	Asp	Ile	Ala	Lys	Lys	Pro	Thr
2150						2155					2160			
Glu	Ser	Ala	Cys	Ser	Ser	Leu	Thr	Val	Leu	Phe	Asp	Gly	Arg	Val
2165						2170					2175			
Glu	Gly	Gln	Val	Asp	Leu	Phe	Arg	Asn	Ala	Arg	Asn	Gly	Val	Leu
2180						2185					2190			
Ile	Thr	Glu	Gly	Ser	Val	Lys	Gly	Leu	Thr	Pro	Ser	Lys	Gly	Pro
2195						2200					2205			
Ala	Gln	Ala	Ser	Val	Asn	Gly	Val	Thr	Leu	Ile	Gly	Glu	Ser	Val
2210						2215					2220			
Lys	Thr	Gln	Phe	Asn	Tyr	Phe	Lys	Lys	Val	Asp	Gly	Ile	Ile	Gln
2225						2230					2235			
Gln	Leu	Pro	Glu	Thr	Tyr	Phe	Thr	Gln	Ser	Arg	Asp	Leu	Glu	Asp
2240						2245					2250			
Phe	Lys	Pro	Arg	Ser	Gln	Met	Glu	Thr	Asp	Phe	Leu	Glu	Leu	Ala
2255						2260					2265			
Met	Asp	Glu	Phe	Ile	Gln	Arg	Tyr	Lys	Leu	Glu	Gly	Tyr	Ala	Phe
2270						2275					2280			
Glu	His	Ile	Val	Tyr	Gly	Asp	Phe	Ser	His	Gly	Gln	Leu	Gly	Gly
2285						2290					2295			

Leu	His	Leu	Met	Ile	Gly	Leu	Ala	Lys	Arg	Ser	Gln	Asp	Ser	Pro
2300						2305					2310			
Leu	Lys	Leu	Glu	Asp	Phe	Ile	Pro	Met	Asp	Ser	Thr	Val	Lys	Asn
2315						2320					2325			
Tyr	Phe	Ile	Thr	Asp	Ala	Gln	Thr	Gly	Ser	Ser	Lys	Cys	Val	Cys
2330						2335					2340			
Ser	Val	Ile	Asp	Leu	Leu	Leu	Asp	Asp	Phe	Val	Glu	Ile	Ile	Lys
2345						2350					2355			
Ser	Gln	Asp	Leu	Ser	Val	Ile	Ser	Lys	Val	Val	Lys	Val	Thr	Ile
2360						2365					2370			
Asp	Tyr	Ala	Glu	Ile	Ser	Phe	Met	Leu	Trp	Cys	Lys	Asp	Gly	His
2375						2380					2385			
Val	Glu	Thr	Phe	Tyr	Pro	Lys	Leu	Gln	Ala	Ser	Gln	Ala	Trp	Gln
2390						2395					2400			
Pro	Gly	Val	Ala	Met	Pro	Asn	Leu	Tyr	Lys	Met	Gln	Arg	Met	Leu
2405						2410					2415			
Leu	Glu	Lys	Cys	Asp	Leu	Gln	Asn	Tyr	Gly	Glu	Asn	Ala	Val	Ile
2420						2425					2430			
Pro	Lys	Gly	Ile	Met	Met	Asn	Val	Ala	Lys	Tyr	Thr	Gln	Leu	Cys
2435						2440					2445			
Gln	Tyr	Leu	Asn	Thr	Leu	Thr	Leu	Ala	Val	Pro	Tyr	Asn	Met	Arg
2450						2455					2460			
Val	Ile	His	Phe	Gly	Ala	Gly	Ser	Asp	Lys	Gly	Val	Ala	Pro	Gly
2465						2470					2475			
Thr	Ala	Val	Leu	Arg	Gln	Trp	Leu	Pro	Thr	Gly	Thr	Leu	Leu	Val
2480						2485					2490			
Asp	Ser	Asp	Leu	Asn	Asp	Phe	Val	Ser	Asp	Ala	Asp	Ser	Thr	Leu
2495						2500					2505			
Ile	Gly	Asp	Cys	Ala	Thr	Val	His	Thr	Ala	Asn	Lys	Trp	Asp	Leu
2510						2515					2520			
Ile	Ile	Ser	Asp	Met	Tyr	Asp	Pro	Arg	Thr	Lys	His	Val	Thr	Lys
2525						2530					2535			
Glu	Asn	Asp	Ser	Lys	Glu	Gly	Phe	Phe	Thr	Tyr	Leu	Cys	Gly	Phe
2540						2545					2550			
Ile	Lys	Gln	Lys	Leu	Ala	Leu	Gly	Gly	Ser	Ile	Ala	Val	Lys	Ile
2555						2560					2565			
Thr	Glu	His	Ser	Trp	Asn	Ala	Asp	Leu	Tyr	Lys	Leu	Met	Gly	His
2570						2575					2580			
Phe	Ser	Trp	Trp	Thr	Ala	Phe	Val	Thr	Asn	Val	Asn	Ala	Ser	Ser
2585						2590					2595			
Ser	Glu	Ala	Phe	Leu	Ile	Gly	Ala	Asn	Tyr	Leu	Gly	Lys	Pro	Lys
2600						2605					2610			
Glu	Gln	Ile	Asp	Gly	Tyr	Thr	Met	His	Ala	Asn	Tyr	Ile	Phe	Trp
2615						2620					2625			
Arg	Asn	Thr	Asn	Pro	Ile	Gln	Leu	Ser	Ser	Tyr	Ser	Leu	Phe	Asp
2630						2635					2640			
Met	Ser	Lys	Phe	Pro	Leu	Lys	Leu	Arg	Gly	Thr	Ala	Val	Met	Ser
2645						2650					2655			
Leu	Lys	Glu	Asn	Gln	Ile	Asn	Asp	Met	Ile	Tyr	Ser	Leu	Leu	Glu
2660						2665					2670			
Lys	Gly	Arg	Leu	Ile	Ile	Arg	Glu	Asn	Asn	Arg	Val	Val	Val	Ser
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Ser	Asp	Ile	Leu	Val	Asn	Asn								
2690						2695								

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<223> S/L3/+4932 primer

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